A PROGRAM FOR MANAGEMENT
1958 . . . No. 10

NOVEMBER 17, 1958

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

GET READY FOR THE NEW BOOM

For how Inland Steel's Joseph Block and other metalworking men do it, see Page 97

- What the Democrats Will Do . . . Page 57
- How To Upgrade Alloy Steels . . . Page 128

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it's mainly a matter of TIMING!

Knowing WHEN to replace obsolete equipment with a new Heald Bore-Matic saved over $54,000 a year!

A MACHINE doesn't have to be very old in years to be obsolete as far as production costs are concerned. And after all, the purpose of any machine is not just to produce, but to produce at a *profit*.

That's why replacement timing is so important. It depends not only on the age and productive capacity of the old machine—but on a careful cost comparison between the old and the *new*. Such a comparison, in terms of investment and return, will tell you when equipment should be replaced, and when it should be retained.

Our sales engineers are well experienced in making such obsolescence studies—on Borizing and grinding equipment. And they will be glad to do the same for you. Similar studies have pointed the way to many important savings.

For Example: A manufacturer of aircraft control equipment purchased a Heald Model 222 Bore-Matic to replace older equipment for boring, turning, facing and grooving on a wide range of parts. Later, their engineers made a detailed analysis on 12 different parts, to evaluate its cost-saving performance in specific terms. It was found that the machine would save over $54,000 in production costs—not only *paying for itself*, but netting a *profit* of over $29,000 in just the first year! The cost comparison, by groups of parts, is shown below.

	Old Method	New Machine
Annual Prod. Cost–Bodies	$53,004	$14,464
Annual Prod. Cost–Housings	18,124	4,917
Annual Prod. Cost–Carriers	3,276	1,404
Annual Prod. Cost–Plates	1,200	630
Total Cost per Year, all parts	$75,604	$21,415
Annual Saving for New Machine		$54,189
Total Purchase Price		$24,967
Net GAIN in One Year		$29,222

YOU pay for obsolescence. Replacement pays for itself!

THE HEALD MACHINE COMPANY

Subsidiary of The Cincinnati Milling Machine Co.

Worcester 6, Massachusetts

Chicago • Cleveland • Dayton • Detroit • Indianapolis • New York

Shiny as a new dime

When you need steel fasteners that look their very best, order Bethlehem electroplated fasteners.

Bethlehem bright-zinc-plated fasteners enhance the appearance of bolting applications because they have a smooth finish that is shiny and rich-looking. They meet ASTM Specifications A-164-55 RS, LS, and GS, and can be produced with definite classes of thread fit in all sizes up to a length of about 30 in.

Bethlehem cadmium-plated fasteners are also available, made to ASTM Specifications A 165-TS, OS, and NS. Type TS is the most popular thickness.

Where conditions call for increased resistance to certain types of corrosion, we have the facilities to passivate electroplated fasteners by means of a dichromate dip, or by using surface conversion coatings, such as iridite and cronak.

Regardless of the styles or quantities you need, just say the word, and we'll have a representative call to tell you more about electroplated fasteners.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

Unusual fasteners are everyday occurrences at Lamson. Some are fairly common; some are not even in existence when we get the order. But we produce each one with the same highly-developed engineering and manufacturing methods that keep costs low and quality at its optimum in Lamson's standard fastener products. Conversely, these same standards benefit from the skill and ingenuity derived in producing special items. These are reasons why you should look to Lamson for leadership in fasteners.

&
S

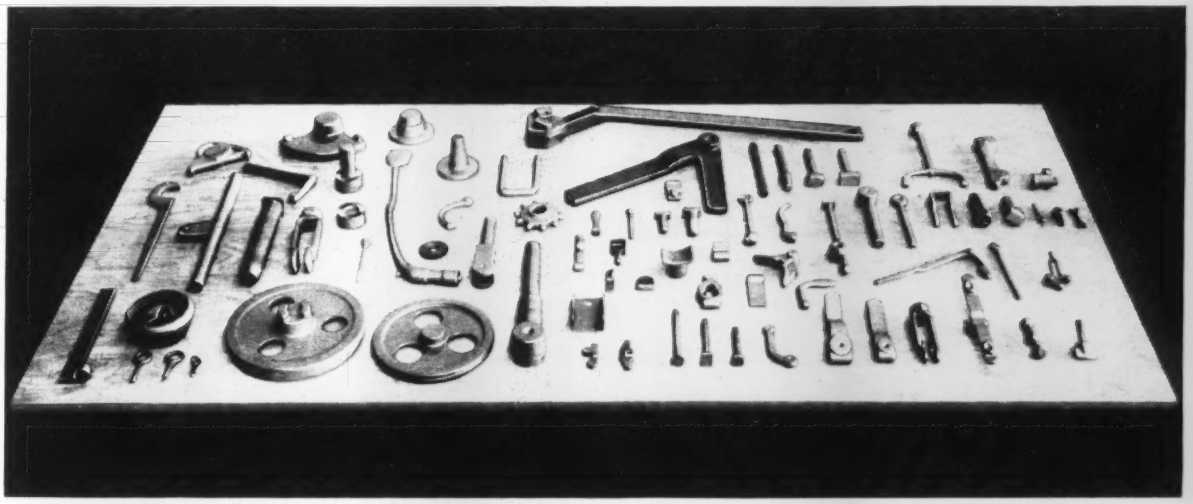
The Lamson & Sessions Co.

5000 Tiedeman Road, Cleveland 9, Ohio • Plants at Cleveland and Kent, Ohio • Chicago • Birmingham

200 Different Parts Heated for Forging-

Better, Faster and at Much Lower Cost

with TOCCO® Induction Heating



• When progressive production people at General Railway Signal Company installed a 200 kw, 3000 cycle TOCCO machine, they were able to eliminate 7 slot-type oil-fired furnaces and produce better forging than ever before—at substantially lower costs.

Cost Down—Fuel costs have been reduced from $15.26 to $1.60 per hour with TOCCO. Expensive furnace lining maintenance has been eliminated, and straightening and reheating operations formerly required are no longer necessary.

With oil-fired furnaces all steam hammer operators needed helpers. With TOCCO most of these helper operations have been eliminated.

TOCCO's fast, automatic operation produces almost no scale and achieves uniform temperatures throughout the entire cross section—improving the quality of the forgings and providing increases of up to 400% in the life of the forging dies.

Overall production costs in the forge shop at G.R.S. have been reduced an impressive 35%!

Flexibility—Production runs at G.R.S. range from a low of 15 pieces to a high of over 50,000. Parts from ½ pound to over 25 pounds are heated, merely by changing inductor coils and power control settings.

Better Working Conditions—TOCCO makes the forge shop a better place to work by doing away with noise, dust, dirt, smoke and radiant heat and gases produced by old fashioned furnaces.

If you're looking for a way to produce similar results in your plant, it will pay you to consult a TOCCO Engineer.

THE OHIO CRANKSHAFT COMPANY

Mail Coupon Today— NEW FREE Bulletin

The Ohio Crankshaft Co. • Dept: S-11, Cleveland 5, Ohio

Please send copy of "Typical Results of TOCCO Induction Heating for Forming and Forging".

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Position_____

Company_____

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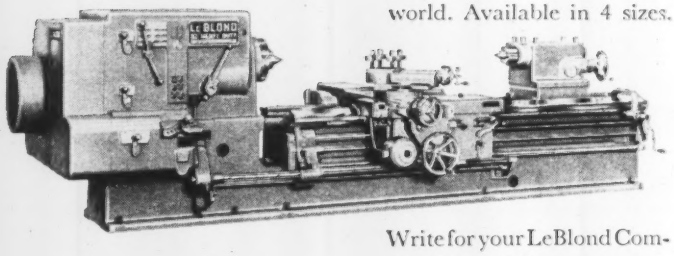
City_____ **Zone**____ **State**_____

THE USEFULEST LATHES IN EVERY CLASS YOU'LL FIND IN THE LINE OF LeBLOND

This is the LeBlond 32"/60" sliding bed gap lathe — three lathes in one, at the cost of a lathe and a half, 50% greater swing capacity, 50% greater center distance. Most versatile lathes in the world. Available in 4 sizes.



Write for your LeBlond Complete Line Catalog No. C-58.

THE R. K. LeBLOND MACHINE TOOL CO. CINCINNATI 8, OHIO

World's Largest Builder of A Complete Line of Lathes for More Than 71 Years

This Week in STEEL The Metalworking Weekly

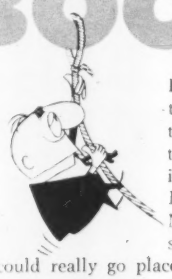
November 17, 1958
Vol. 143 No. 20

EDITORIAL 55

There are degrees of reciprocity. The "normal trade relations" approach is a practical solution.

SPECIAL FEATURE 97

GET READY FOR THE NEW BOOM



How to plan for the long term is the theme of the tenth article in STEEL's 1958 Program for Management series. Your company could really go places in the sixties—and you can do a lot toward changing "could" to "will" with one simple move: Start preparing for the new boom now.

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Labor may push some more liberal legislation through new Congress, but moderation will eventually win.

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Here's your chance to "beat the experts." First prize: A scale model of the fabulous Firebird III.

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Auto industry, with an assist from electric utilities, pushes industrial production index to 1958 high.

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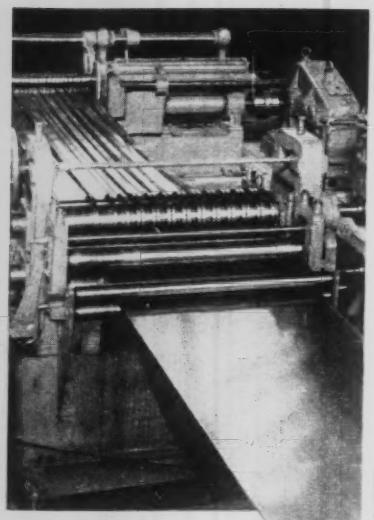

Greater Profit and Operational Flexibility with a YODER SLITTER

Even if you use less than 100 tons of varied strip sizes per month, it will pay you to investigate the savings that are possible through the operation of a Yoder slitter. Savings per ton increase rapidly as coil size and width of strands decrease...so much, that under average operating conditions, a slitter will pay for itself in a few months.

From a small stock of standard mill-width coils, a Yoder slitting line enables you to meet unexpected demands, or to supply "special" width slit strands in a matter of a few hours. This flexible operation increases plant efficiency, resulting in savings of time and money through simplified production planning and greatly reduced strip inventories.

The Yoder line includes slitters of every size and capacity for coil or sheet stock. Send for the all-new, 1958 edition of the Yoder Slitter Book. It is a comprehensive text on the mechanics and economics of slitter operations with time studies, cost analyses, and other valuable data. Write to:

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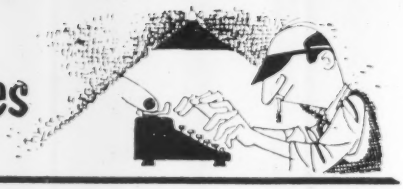
behind the scenes



Alas, Mum's the Word

Symphronsibah Consuella McGillicuddy, nee Jones, descended the stairs with stars in her eyes. Could this radiant young matron be the same old Symphrony Mac who came down those same stairs every day, clad in her conventional duster, and exciting her conventional spouse to the point of a yawn? Indeed, it couldn't be: This Symphronsibah had new Stone shoes on her revived feet, a fetching Robert Hall sack draped about her plump body, and an impressive copy of a Hattie Carnegie hat riding on her freshly made curls. Completing her descent, she glided across the floor and stood in an airy welter of perfume before her husband. "Do you notice anything different about me, Horatio?" she cooed.

"Should I ought to?" inquired Horatio cautiously, lowering his paper, and staring blankly at his beloved. "You mean you got a haircut, or something?"

It is not too difficult to imagine Symphronsibah's feelings at this juncture because everybody on STEEL can understand and appreciate her emotions. Why, you might even say that we're both in the same fix. Here's how it all came about:

A bunch of the boys were whooping it up for some changes in the format of the nation's foremost metalworking weekly. Some of the recommendations were impossible, of course, and some were filed for further study. Editor Walt Campbell and Art Director Bill Kellogg finally agreed that two immediate changes should be put into effect.

"Let's preface each subhead with a No. 1090 dot and allow a 6-point space between each paragraph," said Kellogg brightly. "It will make easier reading."

Accordingly, before the monster presses were started to produce the Oct. 27 issue of STEEL, typesetters bustled about, literally cooking up buckets of No. 1090 dots and 6-point spaces. The magazine, radiant in its dots and spaces, was sent dancing through the mails to every corner of the metalworking world, and the Committee on Type & Layout Improvement sat back to await the expected compliments. This week's issue marks the fourth edition since the typographic improvements went into effect, and (gulp!) STEEL's alert readers might just as well have been so many Horatio McGillicuddys, so far as pertinent comments are concerned.

Good Times Coming

Joseph L. Block, president of Inland Steel Co., adorns this week's cover because he has some interesting things to say about future business conditions, and he doesn't mind looking the world in the eye while he says them. Mr. Block has a wide knowledge of and a deep interest in the various economic factors that affect the steel business. Some of the big reasons for the expected boom in the sixties, he says, are surging population and the St. Lawrence Seaway.

Chicago Editor Bill Dean gathered information from dozens of sources while compiling the current Program for Management article, which appears on Page 97. The information he assembled points unerringly toward a tremendous business boom, and Bill was almost afraid to write it. "Wouldn't I look like a sap," he remarked, "if it turns out that we'll all be selling apples in the sixties after I report all those good forecasts?"

This fear of trusting his own copy brings up the story of the man who bought an expensive barometer. It registered about 10 points below 29, so he wrote a letter of protest to the manufacturers. He went to town to mail the letter, and when he returned, his house was gone.

Editor Bends Brass Ears

What little we remember about the armed services of our beloved republic is frequently flavored with bewilderment. Our side always manages to win wars, but the boys in buttons have a wonderful gift for fouling things up everywhere else along the way. Wherefore we were delightfully surprised to learn that executives of a group of Army public relations officers had invited Associate Managing Editor John Morgan to attend their New Orleans regional meeting Nov. 19 and tell them something about preparing publicity material for the business press.

Seven branches of the Army will be represented: Signal Corps, Quartermaster, Chemical, Ordnance, Transportation, Medical, and Engineers. Those services frequently contribute editorial material to business papers, and if you can remember anything about the way the Army used to be run, those contributions must have covered less space than the red tape that accompanied the items.

We're glad that Morgan is going 'way down yonder to New Orleans to straighten 'em out. If the services follow his instructions, they will get a better press. In the meantime, however, we are worried about John: If the weird fortune that usually dogs him follows him down the Mississippi, he may be obliged to find his way back by way of Pitcairn Island, Sierra Leon, and Gander Bay.

Shirdlu

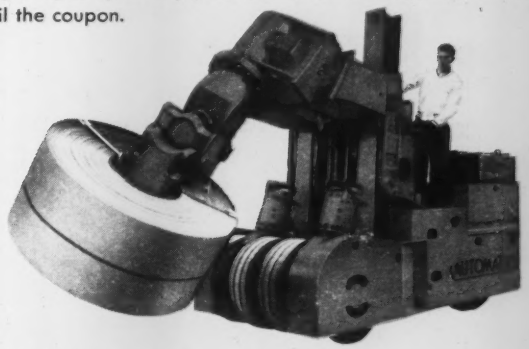
(Metalworking Outlook—Page 51)

BEST OF THE HEAVIES...

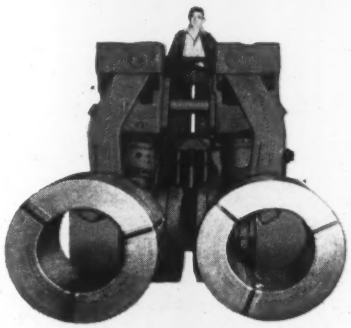
SERIES MF-ELBOLIFT: Works on leverage principle new to lift truck design... eliminates entire mast assembly. Carrying a load of 15,000 lbs., the Elbolift passes easily through any 78" boxcar door... will right-angle stack a 52" long load up to 120" high comfortably in a 13' 8" aisle. CAPACITIES: 12,000 to 20,000 pounds.

Automatic...
Most Complete Line of Steel and Die Handling Equipment
Capacities up to 110,000 lbs. or more

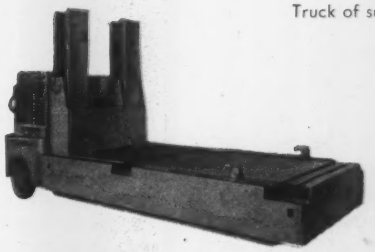
In the heavyweight division of materials handling, no other line matches the versatility and range of Automatic's heavy duty trucks. This is the direct result of many years of specialized engineering and manufacturing experience in the coil and die handling field. The five examples shown here comprise only a small sampling of the wide range of heavy duty handling requirements served by Automatic equipment. So don't hesitate to call us in on any problem involving weights up to any practical limit. No obligation, of course. Just mail the coupon.



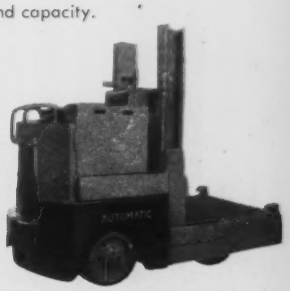
COIL-UPENDER ATTACHMENT: Picks up coil in vertical position and rotates to horizontal or vice versa. Holds coil securely throughout rotation... prevents telescoping. Handles up to 60,000 lbs. Now available on Automatic HR Series or as an attachment for any Automatic Truck of suitable design and capacity.



SKYLIFT GIANT: Heavy duty mast type truck available with either forks or ram. Model shown here has split ram to handle either 1 or 2 coils at a time. CAPACITIES: 20,000 through 80,000 pounds or more.



SERIES TLO: First heavy duty die handlers ever made with completely hydraulic loading, unloading and lift. Bullards move much faster and smoother than in any mechanical system... unloads at end or either side to meet any requirements of space and accessibility. CAPACITIES: 4,000 to 110,000 pounds or more.



MODEL TLO-10: Shortest, most compact 20,000 pound die-handler made... fastest, easiest to maneuver, especially in narrow aisles. Hydraulically operated lift, loading and unloading.

Automatic Electric Industrial Trucks Cost Less to Own... Less to Operate

AUTOMATIC TRANSPORTATION COMPANY
Division of The Yale & Towne Manufacturing Company
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MODELS.....

Your Name.....*Title*.....

Firm.....

Address.....

City & Zone.....*State*.....

Why Grandmother!

Stories on grinding wheel problems—just like the kind you tell the youngsters—can have a happy ending. And we're writing new ones day after day for plants where high grinding wheel costs and low production have been wolfing up profits.

If *you* are ready to "cry wolf," let us send CINCINNATI (PD)° WHEELS to the rescue. For *now* CINCINNATI Grinding Wheels offer POSITIVE DUPLICATION—a remarkable achievement in precision manufacturing and quality control that can *save you money—and increase your production.*

Through the CINCINNATI (PD) Manufacturing Process you are assured Positive Duplication of the original wheel *every* time you reorder. "On grade" with a CINCINNATI (PD) WHEEL means all future (PD) WHEELS will act and grind exactly alike.

Yet CINCINNATI (PD) WHEELS *are priced no higher than ordinary wheels.*

So, if grinding problems have you ready to shout for help, just contact your CINCINNATI Grinding Wheel distributor. Or, contact us direct and we'll send one of our representatives —men who know grinding and grinding machines as well as grinding wheels. Write, wire or telephone—Sales Manager, Cincinnati Milling Products Division, Cincinnati 9, Ohio.

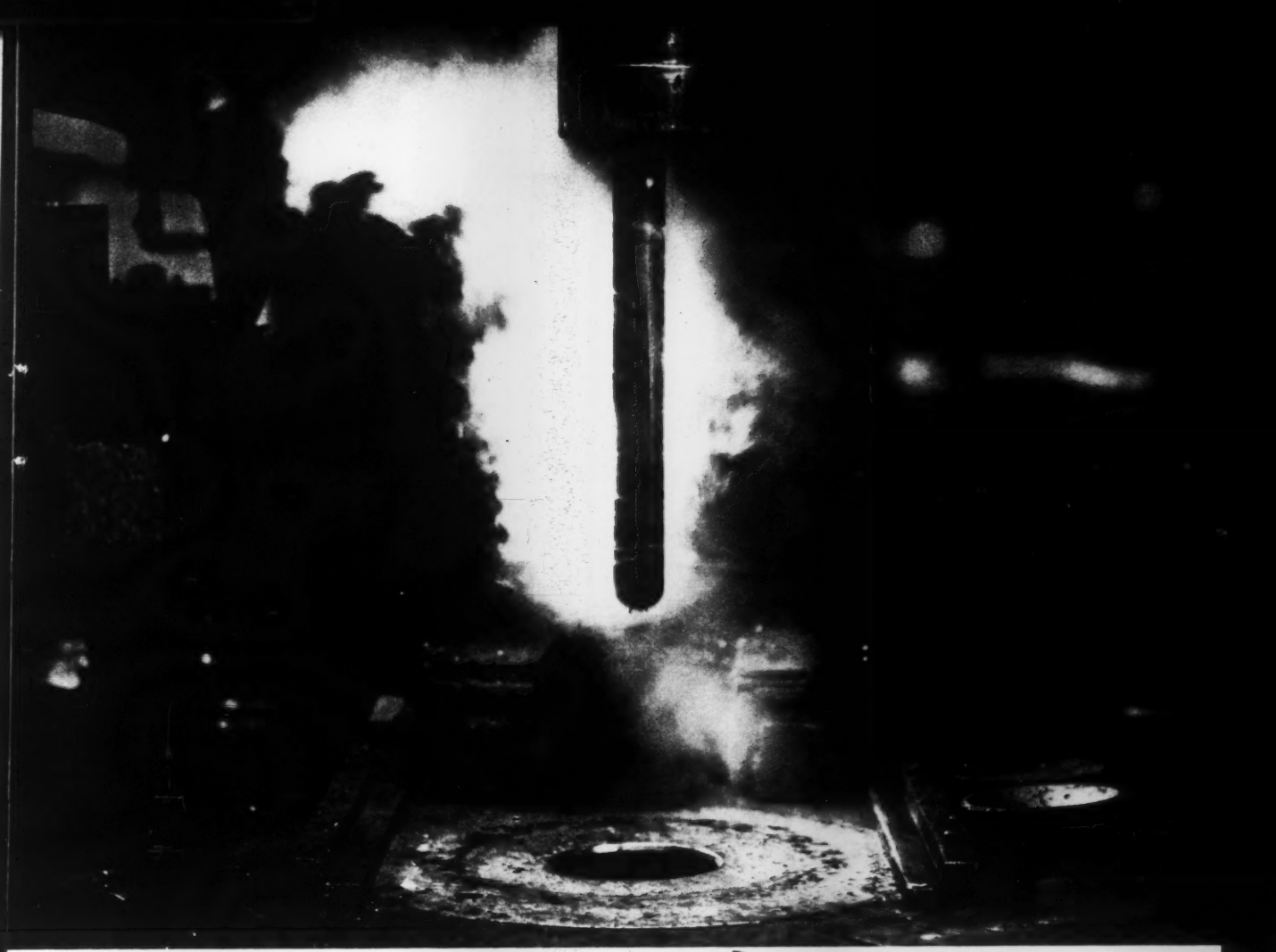
Remember—*only* CINCINNATI Grinding Wheels give you . . .

(PD) POSITIVE DUPLICATION

CINCINNATI° *Grinding Wheels*

A PRODUCTION-PROVED PRODUCT OF THE CINCINNATI MILLING MACHINE CO.

°Trade Mark Reg. U.S. Pat. Off.



Tough 2½" diameter mandrel at Rc 44 on 1150 ton brass extrusion press. Scovill Manufacturing Co.

Mandrel of HALCOMB 218 retains toughness and hardness at hot work temperatures...

This mandrel is made of Halcomb 218—a tough, air-hardening hot work steel. Halcomb 218 is suitable for tools like this which require a higher degree of toughness at moderately elevated temperatures than is obtainable with the tungsten types of hot work steels. And Halcomb 218 *retains both* its hardness and strength at these temperatures.

For example, at a hardness of Rc 44, Halcomb 218's Charpy Impact Strength is 33 ft-lbs at 500F. And it will retain this hardness after 1 hour, after 10 hours and even after 100 hours at temperatures up to 900F.

Properties like these cut tooling costs. The mandrel shown above is good for 1200 pushes, for example, and even then all it needs, usually, is repolishing before being used again.

Halcomb 218 is particularly useful for all hot work operations on which drastic coolants are used. It even resists breaking very successfully when water cooled in operation. If these sound like advantages you can use, call your local Crucible representative for more complete data. *Crucible Steel Company of America, Dept. TK15, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

CRUCIBLE STEEL COMPANY OF AMERICA

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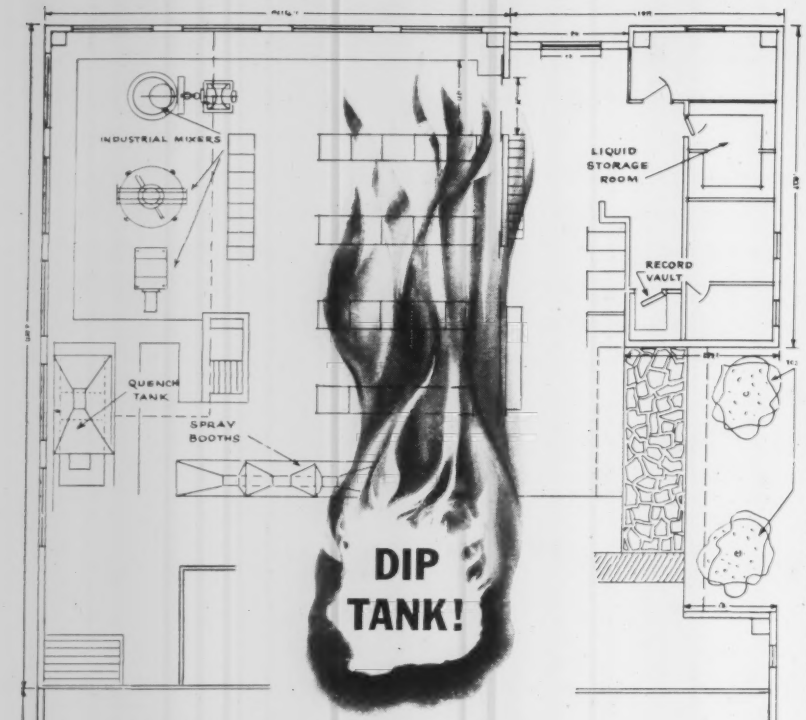

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Guard dip tanks, spray booths, record vaults against the danger of fire! Guard them 24 hours a day with a Kidde fully-automatic carbon dioxide fire extinguishing system. Finest fire protection on the market today, Kidde systems give you these outstanding features that come from more than thirty years' experience!

All operating parts completely enclosed to guard against fouling or accidental operation.

No clumsy triggering methods or falling weights.

Self-contained; no outside power needed.

Visual indicators to show if system has been operated.

Easy testing of all operating parts.

No parts to replace after operation or test.

Fast-acting, clean carbon dioxide does the job that no other extinguishing agent can do: snuffs fire out in seconds, then vanishes into thin air. Won't harm valuable machinery, leaves no mess to clean up. For detailed information see Sweet's Plant Engineering Catalogue or write Kidde today.

Kidde (K Kidde) **Walter Kidde & Company, Inc.**
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LETTERS TO THE EDITORS

Technical Secretary Queries

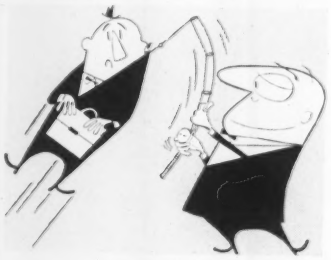
"Space Age Secretaries" (Oct. 6, Page 43) was interesting. I would like to know where I can receive additional information in reference to training of technical secretaries, what schools offer courses, or where the National Association and Council of Business Schools is located.

Mary Saville

Walter Kidde & Co. Inc.
Belleville 9, N. J.

• *We suggest you write to Dr. S. M. Vinocour, Executive Development Services, Du Pont Circle Bldg., Washington 6, D. C.*

Tougher Recruiting



May we comment on how interesting we found, "Top Talent Is Tougher To Get" (Oct. 27, Page 38)? We are looking forward to receiving ten additional copies.

S. M. Florek

Secretary-Treasurer
U. S. Carbide Tool Inc.
Cleveland

• • •

Will you send us eight additional copies?

Webb L. Kammerer

President
Midvale Mining & Mfg. Co.
St. Louis

Copper: Informative Guide

We are highly elated and impressed with "Copper and Its Alloys" (Oct. 27, Page 75). May we have 12 reprints?

T. S. Howald

Mechanical Metallurgist
Midwestern Div.
Chase Brass & Copper Co.
Cleveland

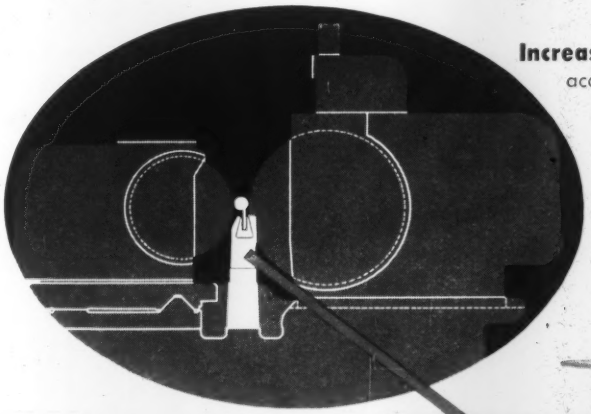
• • •

The director of purchasing for our atomic and defense product groups indicated his extreme pleasure with the fine article, "Copper and Its Alloys."

He was so impressed with it that he

(Please turn to Page 12)

Exclusive Landis feature increases centerless production . . . permits heavier cuts without loss of finish or accuracy



Increased production with better finish and accuracy because the stationary work rest is anchored solidly to heavy, rigid bed.

Landis No. 12
Centerless Grinder

condensed specifications	model #12	model #12½
Work capacity (diameter)	1/16"-3½"	½"-3½"
Standard Wheel Widths	4", 6", 8"	4", 6", 8", 10"
Wheel Drive Motors	15 hp. Max.	25 hp. Max.

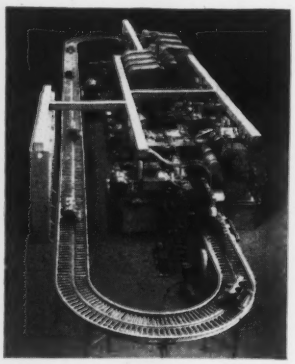
LANDIS
precision grinders
LANDIS TOOL COMPANY / WAYNESBORO, PENNA.

STEEL from Wheelock, Lovejoy BULLETIN

W-L DETROIT For the first time, HY-TEN D-2 air hardening steel now available here in rounds, squares, flats and billets. Also a fine stock of standard alloy grades, especially A-8620, as well as all HY-TEN grades. Excellent service from our new warehouse.

W-L CHICAGO Steady demand for "B" No. 3X for flame-hardened parts such as boring bars. Good stocks of HY-TEN AIS the best carburizing alloy steel, and freest machining available today—a new W-L exclusive!

W-L CINCINNATI This 23-station Avey Line-O-Dex transfer machine, designed and built by The Avey Division of Motch & Merryweather Machinery Co., Cincinnati, Ohio, is equipped with spindles made of our HY-TEN "B" No. 2. This grade was chosen for its great tensile strength (100,000 P. S. I. in the natural condition), toughness, and fine wearing qualities.



W-L CAMBRIDGE We are now distributing FLEXANGLE, the easy-to-erect structure assembly for all types of racks, shelves, platforms, etc. It's completely universal and low in cost—can be used anywhere, by anyone, for any storage purpose.

W-L HILLSIDE Our stock of flat and square sizes in HY-TEN M Temper Oil Hardening Steel can save you time and money in your tooling program. HY-TEN "B" No. 3X pre-heat treated in rounds, squares and flats available in a wide range of sizes. Billets on hand for hammer forging in all grades of HY-TEN.

W-L CLEVELAND Excellent stock of brake die flats and squares. Also many sizes up to 16" x 18" in HY-TEN Mold Steel. Excellent deliveries.

W-L BUFFALO A wide range of rounds and hexagons in cold drawn AISI leaded and non-leaded A-4140. Also many sizes of the new "B" No. 3X-40 in rounds and hexagons.

Write our Cambridge office today for your *free* Wheelock, Lovejoy Data Sheets. They'll give you complete technical information on grades, applications, physical properties, tests, heat treating, etc.

WHEELOCK, LOVEJOY & COMPANY, INC.
131 Sidney Street, Cambridge 39, Mass.
AMERICAN STEEL WAREHOUSE ASS'N

AGENTS: Southern Engineering Company, Charlotte, N. C.; Sanderson-Newbould, Ltd., Montreal & Toronto

LETTERS

(Concluded from Page 10)

asked if we could obtain 20 copies to distribute to the Westinghouse copper committee for information and guidance.

R. V. McGahey
Manager-Technical Publicity
Westinghouse Electric Corp.
Pittsburgh

Furnace Supplier Speaks Up

Referring to "Vacuum Casting Tames Supermetals" (Oct. 20, Page 191), we would like to point out that the induction melting furnace shown in the photograph of the Wilbur-Driver installation was supplied by Tocco Div., Ohio Crankshaft Co., Cleveland.

It is the latest design for vacuum use, being powered by a 350 kw, 1 kc generator. The furnace is of 2000 lb capacity, equipped with flexible power leads.

Robert J. Kasper
Development Engineer
Tocco Div.
Ohio Crankshaft Co.
Cleveland

Aids Business Community

We received copies of "Surveying the Market," No. 7 in STEEL's 1958 Management series. They will be distributed to 33 field offices of the U. S. Department of Commerce throughout the country and to officials in the department.

Thanks for the excellent job you have been doing in making known the availability of business aids to the business community.

Zelda W. Milner
Chief
Library & Research Division
U. S. Department of Commerce
Cleveland

Steam Roller of Hard Fact

Your report, "Soviets Expand Steel in Race with U. S." (Sept. 8, Page 85), is a steam roller of hard fact, and I hope it receives widest possible dissemination.

As the two steam rollers are about to crash into each other, there will be an immediate imperative for finding the safety discipline. This is the subject on which I have been working for 12 years.

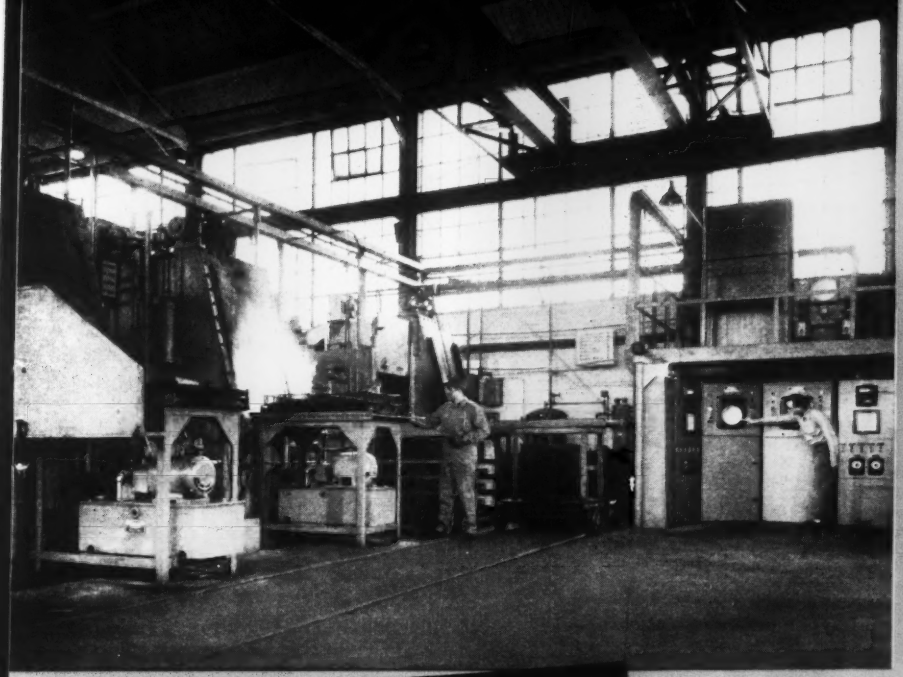
Howard G. Kurtz Jr.
Handy Associates Inc.
New York

Praises Work Simplification

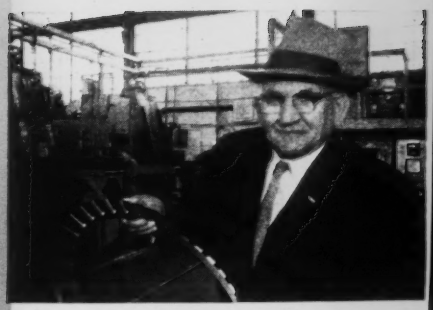
Boeing Airplane Co. has had a work simplification training program in operation for over three years. Therefore, "To Boost Productivity, Consult Your Employees" (Sept. 29, Page 65), was read by my staff with considerable interest. Congratulations on a fine article.

May I have at least two additional copies?

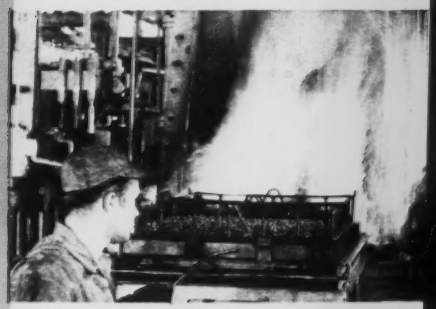
William J. Fritz
Work Simplification Supervisor
Boeing Airplane Co.
Seattle



Lindberg-Designed



Charles Hewitt, President of Dayton, says, "The Lindberg installation has kept our production at a consistently high quality level."

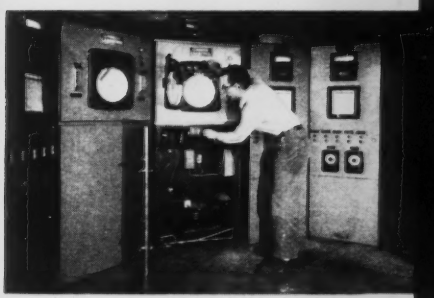


Work loads are positioned manually, but entire furnace operation is fully automatic.

Unique Installation Cuts Heat Treating Costs and Improves Quality at Dayton

Here is a remarkable set-up for general heat treating now in operation at Dayton Forging & Heat Treating Company, Dayton, Ohio. Two integral quench atmosphere furnaces, largest of this type ever built by Lindberg, and one atmosphere tempering furnace in a "three-in-a-row" arrangement that simplifies transfer operation. Combined with Lindberg Carbotrol and Hyen generator, the entire furnace operation is completely automatic, including atmosphere control and recording. Planned by Dayton and Lindberg engineers, the installation runs around the clock, six days a week, reducing costs and producing cleaner end products, brighter job finish, freedom from "decarb" and a consistently higher quality of work.

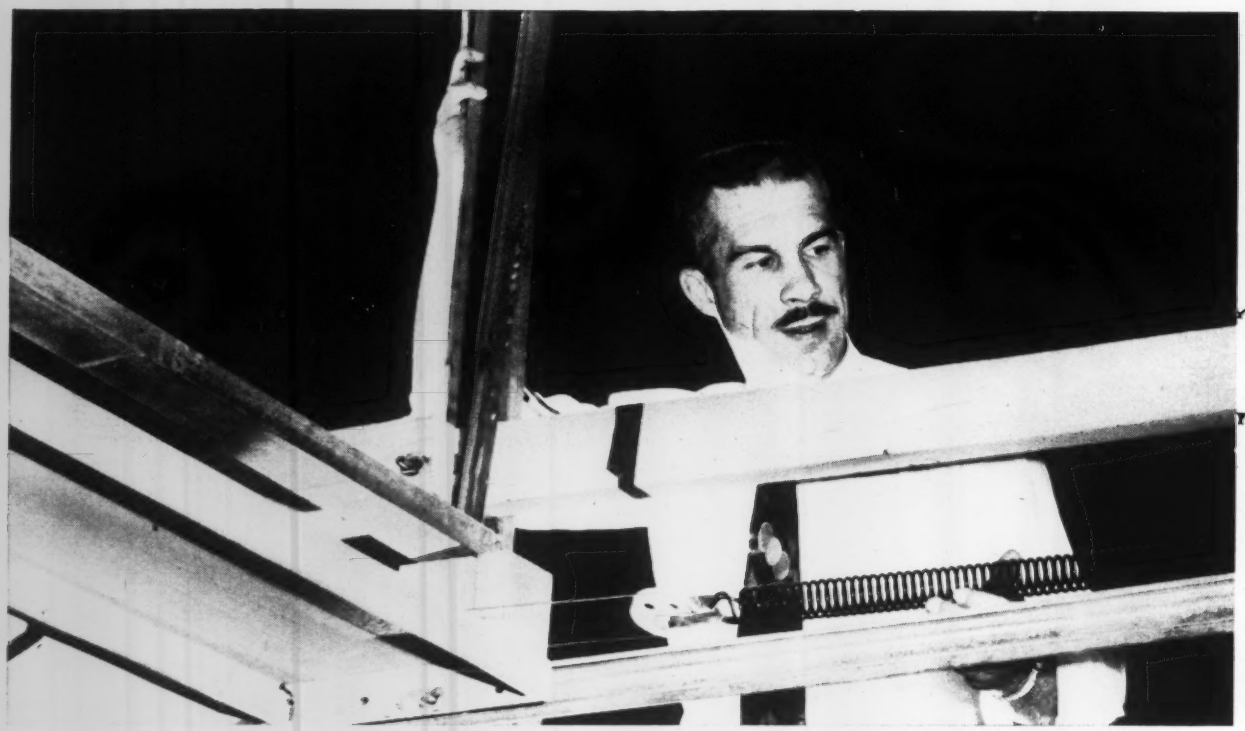
This is another example of how Lindberg equipment and Lindberg planning can help you find the most effective answer to any problem of applying heat to industry. We cover the field, heat treating, melting and holding, tempering, brazing, enameling furnaces, ceramic kilns, high frequency units, and are in the ideal position to recommend just the type of equipment most suitable for your needs. This can be factory built or field-installed in your own plant, fuel-fired or electric, whatever is best suited to your production processes. Consult your local Lindberg Field Representative (see the classified phone book) or get in touch with us direct. Lindberg Engineering Company, **2441** West Hubbard Street, Chicago 12, Illinois. Los Angeles Plant: 11937 S. Regentview Avenue, at Downey, California.

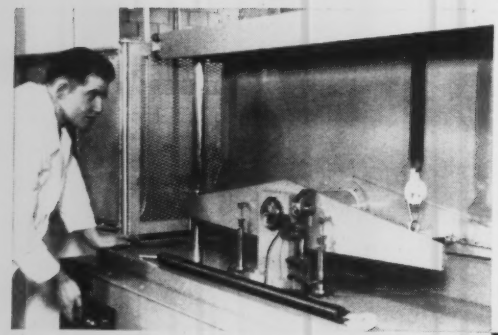


Lindberg Carbotrol unit automatically controls and records "dew point" and heating cycles of endothermic atmosphere.

Lindberg's "dimple" vertical radiant tubes give remarkably trouble-free service and function at all times at full efficiency.

LINDBERG heat for industry



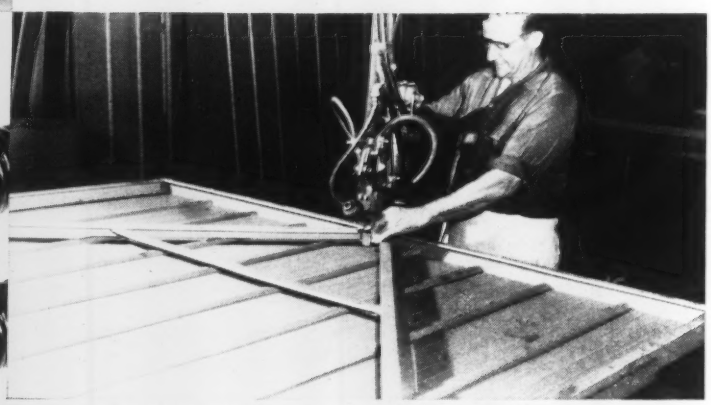


At Steel Door . . .

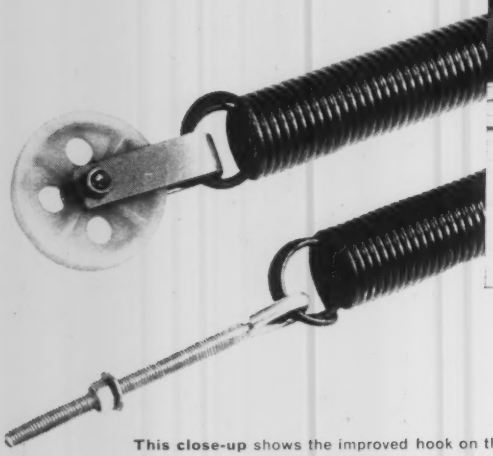
USS American Springs

thanks to AS&W

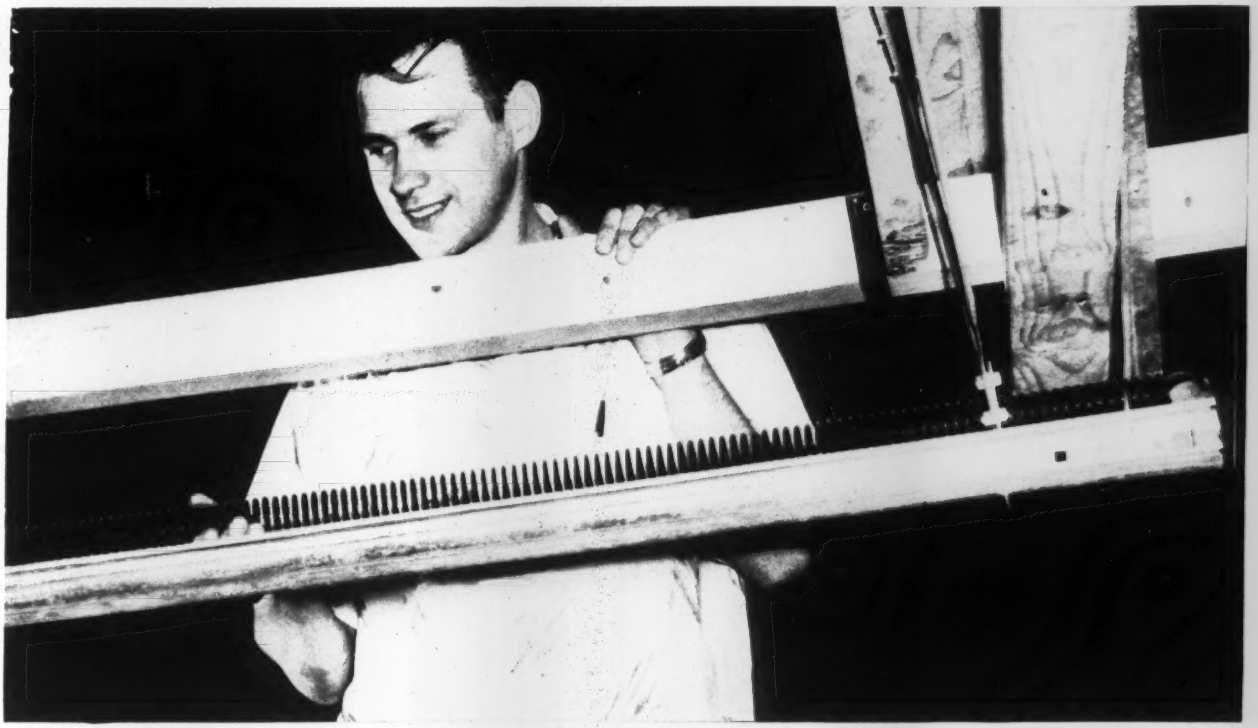
In the American Steel & Wire Fatigue Laboratory, a technician runs tests on a USS American Spring, designed for Steel Door use. On the basis of this test a change in hook design was recommended to give longer spring life.



A Steel Door workman assembles a Berry One-Piece Door. This company uses steel exclusively for all doors because of its many consumer advantages. Steel is stable, won't warp or swell. Steel doors need less maintenance and preparation, and steel doors are easy to operate.



This close-up shows the improved hook on the extension springs supplied by American Steel & Wire for the Steel Door overhead garage doors.



stretched 31,000 times and still going strong...

Spring Engineering Research Service

The Steel Door Corporation, Birmingham, Michigan, is the world's largest manufacturer of residential garage doors. For the production of these doors they use about 150,000 USS American Springs every year. Steel Door asked American Steel & Wire for a statistical evaluation of the fatigue life of the extension hook-type springs they use. The AS&W Spring Engineering Research Service tested these springs in the Fatigue Laboratory and recommended a change in hook design.

So successful was this design change that the life of the springs has been materially increased. At the Steel Door plant a cycle test was set up using USS American Springs on an overhead door. At the present time these springs have completed over 31,000 cycles without showing any sign of failure. This is the equivalent of 25 years of normal usage.

Mr. Ralph Qualman, Advertising Director and Service Manager, says: "It is extremely important that the springs—especially those used on sectional doors where the strain is greatest—have proper tension and a long life. American Steel & Wire supplies Steel Door with springs that meet their engineering specification and life expectancy."

If you have a spring problem or would like advice on the use of springs in your product, get in touch with our general offices in Cleveland, or any American Steel & Wire Sales Office. You can benefit from the knowledge of AS&W's Spring Engineering Research Service. The Service has been engaged in laboratory experiments of static and dynamic testing for 20 years and has accumulated invaluable data on stress and fatigue life of steel springs, while endeavoring to improve efficiency in the use of steel—from steel chemistry through product application—to more economically cope with today's rigorous demands. This accumulated knowledge of the AS&W Spring Engineering Research Service is at your disposal. *American Steel & Wire, General Offices: Rockefeller Building, Cleveland 13, Ohio.*

USS and American are trademarks

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Cleveland Room

Dine in the splendid old world setting of a grand dining room. The menu is varied, the service unexcelled.

Bronze Room

One of the brightest of the city's supper clubs. Dancing nightly from 9:00 p.m.
Air conditioned, of course.

Rib Room

A true specialty restaurant For Fabulous Roast Beef, roasted, carved and served to your order.

MEN'S BAR

Strictly stag — is this all male haven for good drinks, good food and good talk. Plus sports events on TV.

TRANSIT BAR

For *rapid* service in the most unique bar in the country . . . decorated with an outstanding collection of miniature trains.

the PATIO

Pause — in the relaxing, informal atmosphere of the gayly decorated Patio. It's a Cleveland habit to say — "Meet me at the Patio."

Coffee Shop

Service is brisk and decor cheerful in the modern, air-conditioned coffee shop. Enjoy a tasty sandwich or a moderately priced meal.

HCA Hotel Cleveland
CLEVELAND, OHIO

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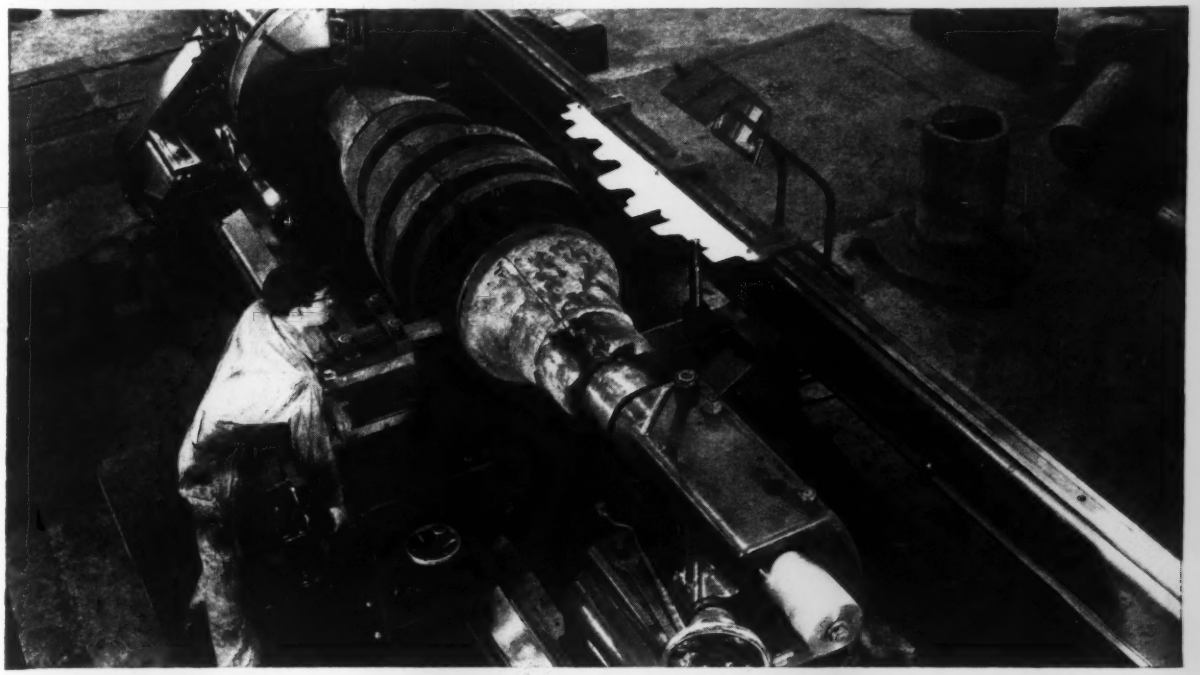
contour turning of iron and steel rolls



NEW—

THIS MODERN CONTOUR LATHE, one of the largest made—50″ x 24′—is the latest addition to the roll shop at National. Equipped with a complete hydraulic contour attachment, this lathe machines the largest rolls, accurately and quickly to exact specifications.

Plant expansion and new equipment are the keynote at National—all planned to give you better iron and steel rolls—when you need them and for all rolling mill operations.

GENERAL STEEL CASTINGS CORPORATION

National Roll & Foundry Division

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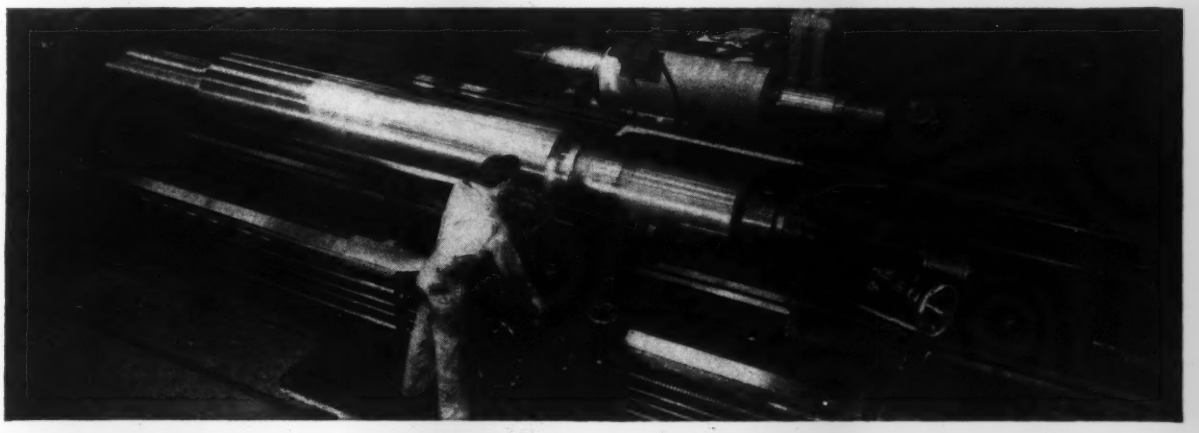
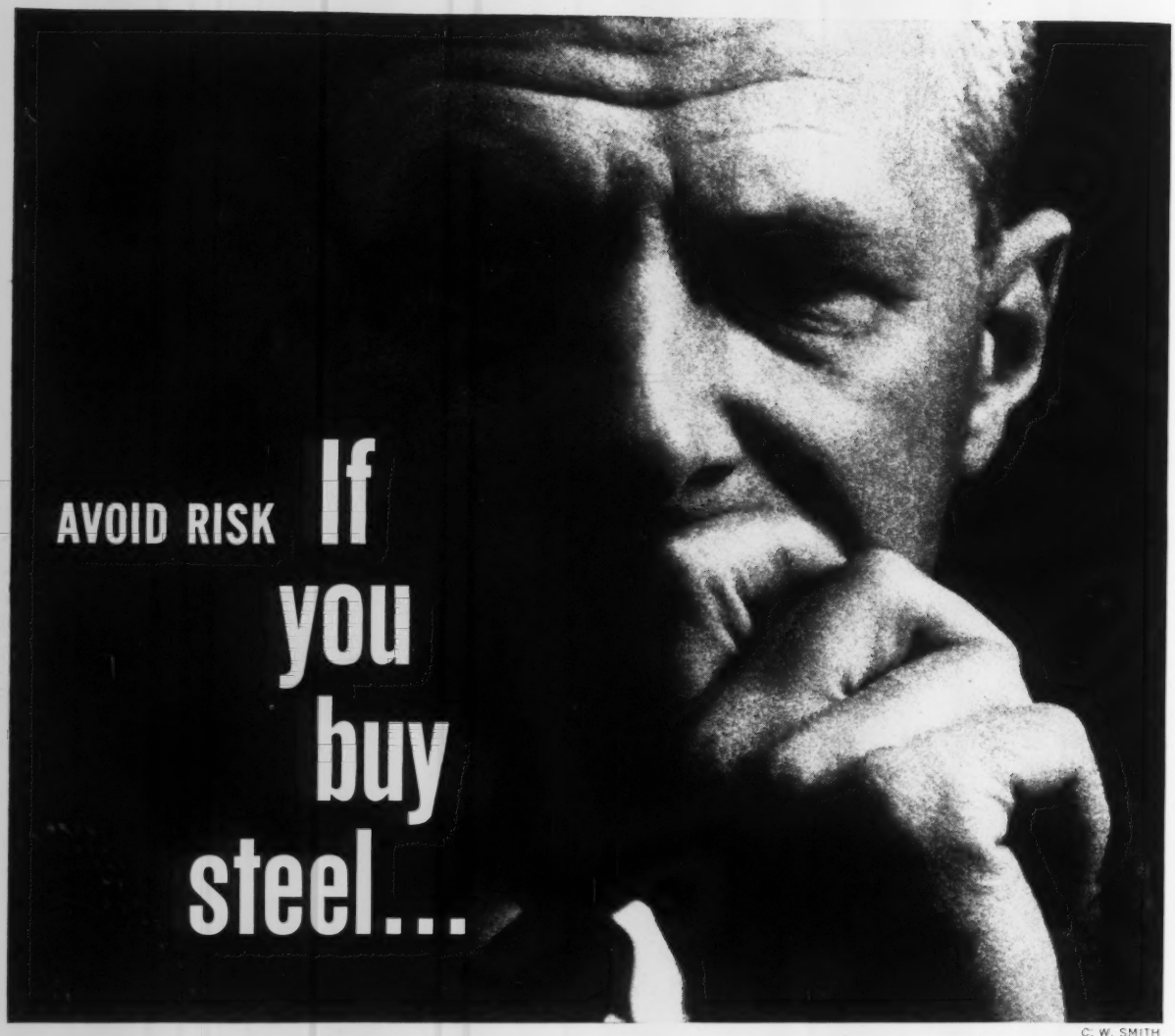




C. W. SMITH

USE OUR INVENTORY to continue your cost-reduction program

When business slows down, you get tough, tighten your belt, and cut back steel inventory because you free capital that way and save on costs of space, handling, taxes, obsolescence and wastage. You avoid big-inventory risks by buying from a Steel Service Center. That's good business.

But when business speeds up again, do you soften and let these economies—plus your protection from risk—go out the window?

Doesn't it make sense to *continue* your cost-reduction program? Why not continue free-of-risk steel buying from your Steel Service Center . . . get all the steel you need delivered when you say, cut to exact size and ready for use.

Compare all your costs of inventoried steel with what our steel will cost you. Use the chart at the right. Or get the booklet *What's Your Real Cost of Possession for Steel?* from your nearby Steel Service Center. American Steel Warehouse Association, Inc., 540 Terminal Tower, Cleveland 13, Ohio.

COST OF POSSESSION FOR STEEL IN YOUR INVENTORY

Per ton delivered	
Cost of capital:	
Inventory	
Space	
Equipment	
Cost of operation:	
Space	
Material handling	
Cutting & burning	
Scrap & wastage	
Other costs:	
Obsolescence	
Insurance	
Taxes	
Accounting	
TOTAL	

COST OF FREEDOM-FROM-RISK STEEL FROM YOUR STEEL SERVICE CENTER

Per ton, cut-to-size, and delivered

TOTAL

AMERICAN STEEL WAREHOUSE ASS'N

The American Steel Warehouse

...YOUR STEEL SERVICE CENTER

Lowest blast cleaning cost ever with

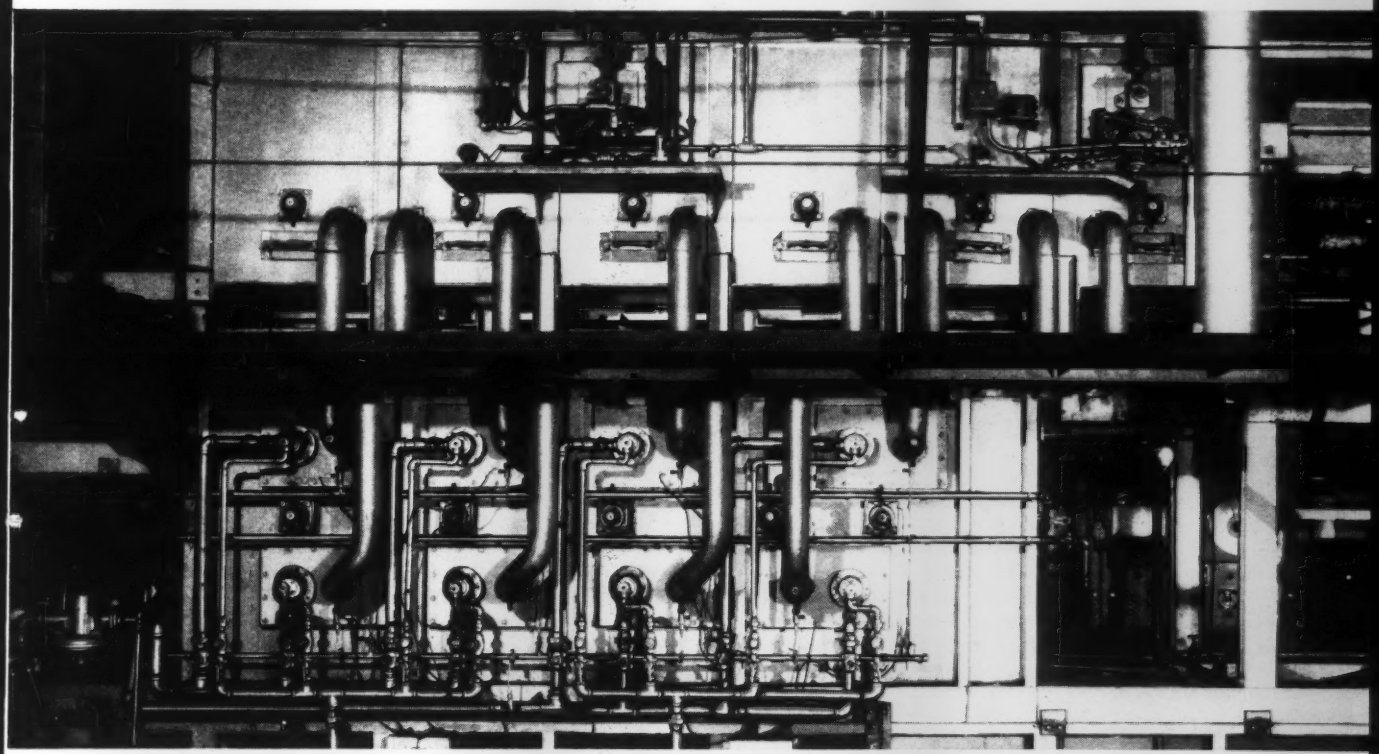
ROTOBLAST® STEEL SHOT

✓ Vacuum Casting

Electric furnace alloy steel, for the first time shotted in revolutionary vacuum chamber for greater density, eliminating voids and defects. You get a fatigue resisting shot for better, faster cleaning.

✓ Continuous Heat Treating in Controlled Atmosphere

Uniform heating for every particle, in controlled atmosphere (zero oxygen), gives you ball bearing, heat treating quality for uniform hardness and longer wear life.



This is one of the new Rotoblast Unit Line Furnaces, the first of their type, with which Pangborn is bringing a new concept of quality to the steel abrasive industry.

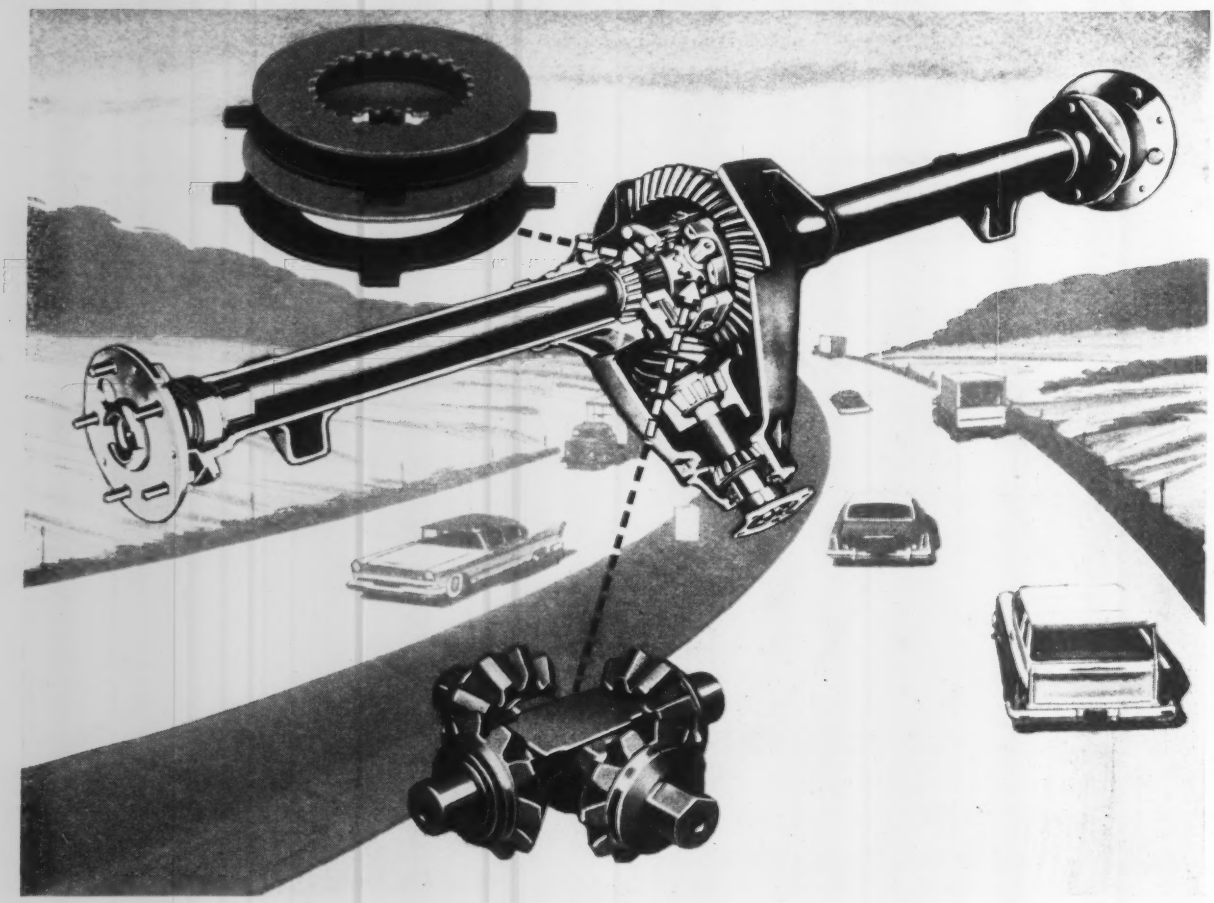
Pangborn

See for yourself! Call the Pangborn Engineer in your area or write PANGBORN CORP., 1600 Pangborn Blvd., Hagerstown, Md.

Rotoblast® Steel Shot

Problem-Solving Products from Republic

PROVIDE SUPER TOUGHNESS AND STRENGTH AT CRITICAL POINTS IN AUTOMOTIVE DIFFERENTIALS



Modern passenger cars with increasing horsepower present problems in high speed stability and handling. The Powr-Lok differential, developed by the Dana Corporation, Toledo, Ohio, permits an automotive axle to transmit the greatest driving force to the rear wheel having the better traction.

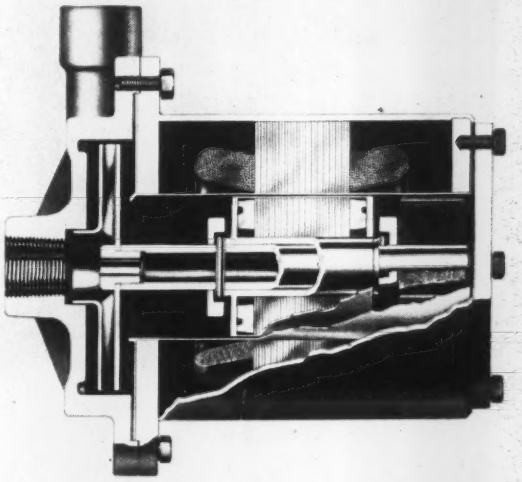
Essential to the economical and dependable operation of these differentials are Republic Alloy Steels. Why? Because only alloy steels have the high strength, toughness, shock-resistance, and abrasion-resistance needed to withstand the severe service to which differential clutch rings and side gears are subjected.

By specifying Republic Hot Rolled 8615 Alloy Bars, Dana engineers have reduced the possibility of a mechanical breakdown to an absolute minimum.

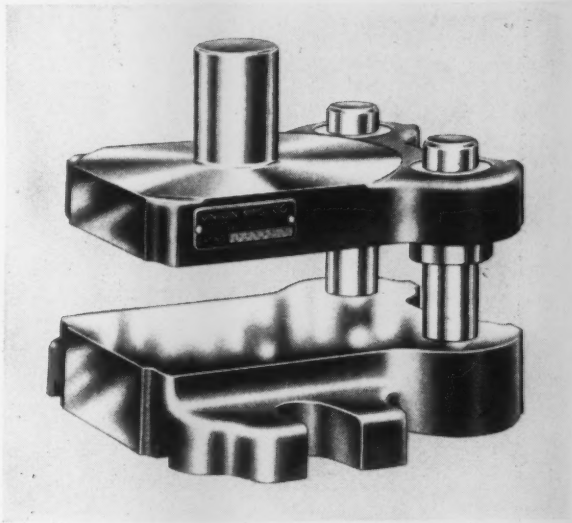
These fine steels offer superior toughness and strength to withstand torque, fatigue, shock, and stress. Alloy steel's uniform response to heat treatment gives these rings and gears hard surfaces around tough cores providing maximum resistance to abrasion, friction, and wear.

In Republic Alloy Steels you will find highest strength values—plus an exceptionally high strength-to-weight ratio that permits the designing of thinner sections to save weight and hold down size without any sacrifice of needed strength.

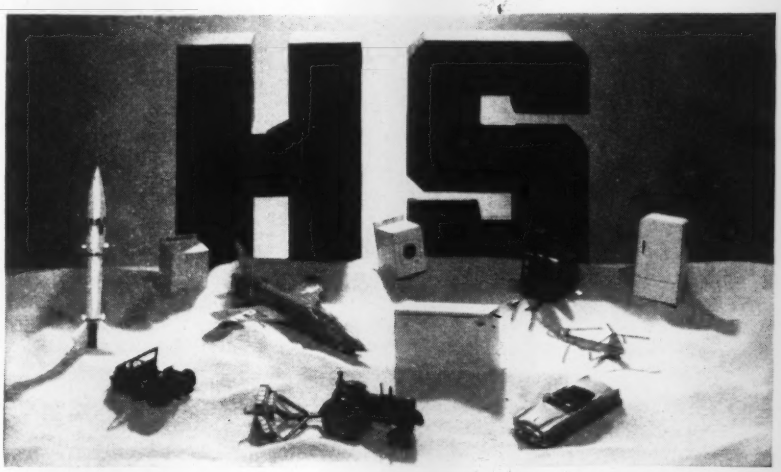
Republic's 3-Phase Metallurgical Service—field, mill, and laboratory—is always available to help you apply these quality alloy steels to your product. It's confidential. There's no obligation. Send coupon for more information.



REPUBLIC TITANIUM is machined for all wetted parts in this seal-less, leak-proof centrifugal pump made by Chempump Corporation, Philadelphia. Titanium was selected for this application because of its maximum corrosion-resistance and exceptionally high strength-to-weight ratio. Chempump's exclusive design makes it possible and economical to use Republic Titanium for vital pump parts. Send coupon for more facts on machining and fabricating Republic Titanium.



REPUBLIC CHATEAUGAY PIG IRON meets demands for both strength and accurate machining in die sets manufactured by the Union Manufacturing Company, New Britain, Connecticut. As a result, Union has standardized on Chateaugay, low phosphorus, copper-free pig iron for maximum strength, flaw-free, easy-to-machine castings. Other superior characteristics of Chateaugay include its exceptional fluidity, even cooling, and fine dense grain structure. For complete information mail coupon.



REPUBLIC'S NEW HIGH STRENGTH POWDER, TYPE 6460, opens the way to new markets for new applications using sinterings for highly stressed parts. Type 6460 can be used with existing operating equipment. It provides a minimum tensile strength of 60,000 psi at 6.4 density as sintered, and 100,000 psi heat treated. Type 6460 maintains its dimensional characteristics after sintering—less than .004 inches per inch shrinkage from die size at 6.4 density. Available in production quantities up to and including 12 tons, or in multiples thereof. Mail coupon for technical data sheet on Type 6460 Powder.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

REPUBLIC STEEL CORPORATION
DEPT. ST-6440
1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

Have a metallurgist call.
☐ Alloy ☐ Pig Iron
☐ Metal Powder ☐ Titanium

Send more information on these Republic products:
☐ Alloy Steel ☐ Stainless Steel
☐ Type 6460 Powder ☐ Titanium

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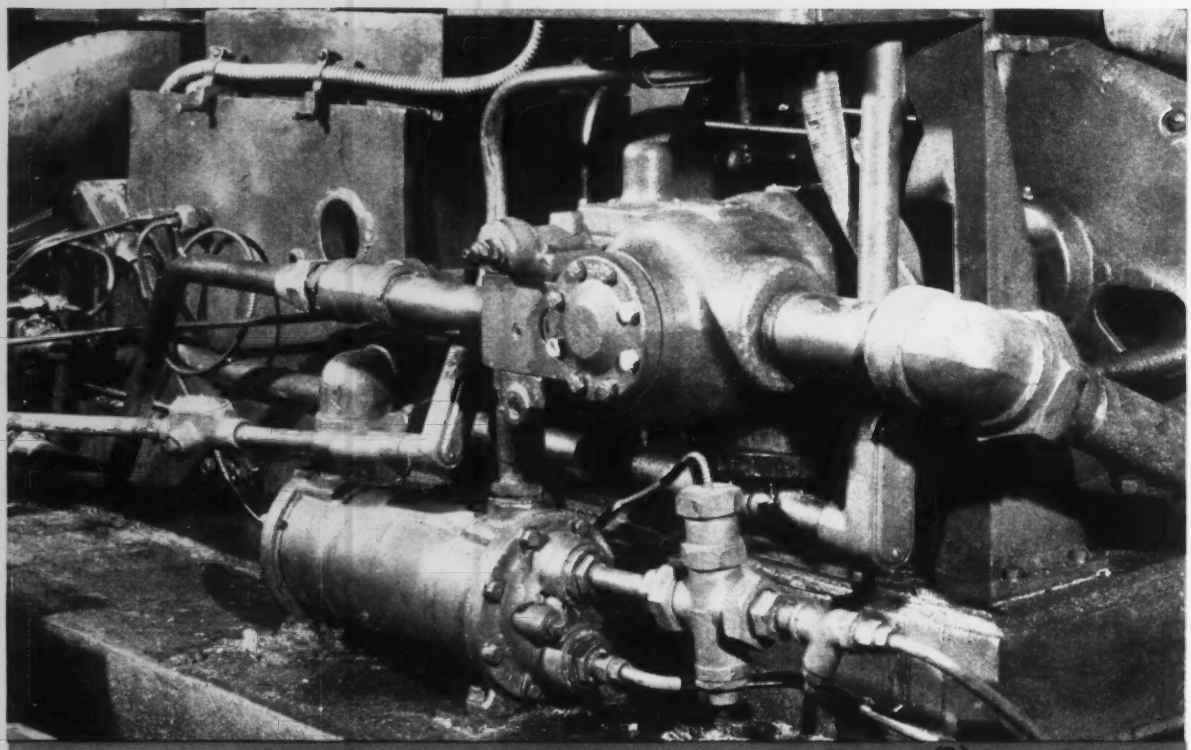


Die caster takes Houghto-Safe out—TO SAVE (?) MONEY
. . . then brings Houghto-Safe back—TO SAVE PUMPS

In three years of continuous operation with Houghto-Safe 600 Series water-glycol fluid, the only downtime for this die casting machine was caused by a broken line. Houghto-Safe sprayed on molten metal. With oil-base fluid, it would have meant a serious fire. But production was resumed within a few hours, because Houghto-Safe didn't burn. Then came the decision to try a lower cost oil-water emulsion (Not Houghton's).

Savings appeared worthwhile when the oil-water fluid was installed. But in service, the fluid separated. Oil stayed at the top of hydraulic supply tanks. Water stayed at the bottom.

Result: fast and excessive pump wear. Within 6 months, downtime repairing pumps and waiting for pump parts became so great that the decision was made to replace the oil-water with a fluid with better lubricating power.

Houghto-Safe 600 Series fluids were again chosen, on the basis of their previous trouble-free performance and complete safety.

A costly test, but it shows why Houghton Engineers recommend Houghto-Safe 600 Series fluids for 85% of all applications. Houghto-Safe 1000 Series phosphate ester type fluids are recommended where temperature or design conditions do not permit the use of water-base fluids.

You can depend on Houghton hydraulic fluids for the best solution to hydraulic safety problems, for both best value and best service. Write today for Houghton's new hydraulic fluids bulletin. Get acquainted with the most complete line of fire-resistant and oil-base hydraulic fluids available from any single supplier today. Address: E. F. Houghton & Co., 303 West Lehigh Ave., Philadelphia 33, Pa.

HOUGHTO-SAFE & HYDRAULIC PACKINGS
. . . products of

E. F. HOUGHTON & CO.
PHILADELPHIA · CHICAGO · DETROIT · SAN FRANCISCO

Ready to give you on-the-job service . . .

CALENDAR
OF MEETINGS

Nov. 17-21, American Rocket Society: Annual meeting, Statler-Hilton Hotel, New York. Society's address: 500 Fifth Ave., New York 36, N. Y. Executive secretary: James J. Harford.

Nov. 17-21, Society of the Plastics Industry Inc.: National plastics exposition and conference, International Amphitheatre and Morrison Hotel, Chicago. Society's address: 250 Park Ave., New York 17, N. Y. Executive vice president: William T. Cruse.

Nov. 18-20, American Standards Association: Conference on standards and annual meeting, Roosevelt Hotel, New York. Association's address: 70 E. 45th St., New York 17, N. Y. Managing director: E. F. Hussey.

Nov. 20-21, National Foundry Association: Annual meeting, Drake Hotel, Chicago. Association's address: 53 W. Jackson Blvd., Chicago 4, Ill. Executive secretary: Charles T. Sheehan.

Nov. 30-Dec. 5, American Society of Mechanical Engineers: Annual meeting, Statler-Hilton and Sheraton-McAlpin Hotels, New York. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: C. E. Davies.

Dec. 1-5, Exposition of Power and Mechanical Engineering: Coliseum, New York. Sponsor: American Society of Mechanical Engineers, 29 W. 39th St., New York 18, N. Y. Secretary: C. E. Davies.

Dec. 2, Electric Overhead Crane Institute: Annual meeting, Statler-Hilton Hotel, Washington. Institute's address: 1 Thomas Circle, Washington 5, D. C. Executive secretary: Joe H. Peritz.

Dec. 2-3, Spring Manufacturers Association: Annual meeting, Barbizon-Plaza Hotel, New York. Association's address: 222 Main St., Bristol, Conn. Secretary: George E. Underwood.

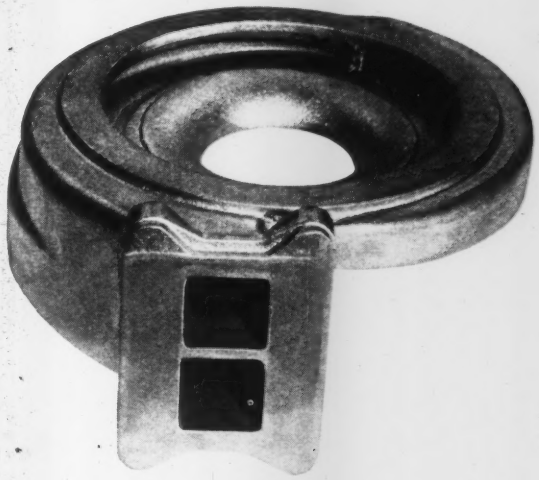
Dec. 3-5, AIME Metallurgical Society: Electric furnace steel conference, Hotel Statler-Hilton, Detroit. Institute's address: 29 W. 39th St., New York 18, N. Y. Secretary: Ernest Kirkendall.

Dec. 3-5, National Association of Manufacturers: Congress of American Industry, Waldorf-Astoria, New York. Association's address: 2 E. 48th St., New York 17, N. Y. Executive vice president: Charles R. Sligh Jr.

Dec. 7-9, Material Handling Institute Inc.: Annual meeting, Roosevelt Hotel, New York. Institute's address: 1 Gateway Center, Pittsburgh 22, Pa. Managing director: L. West Shea.

Dec. 8-10, American Nuclear Society: Winter meeting, Sheraton-Cadillac Hotel, Detroit. Society's address: Chicago 1, Ill. Executive secretary: Octave J. DuTemple.

Dec. 10-11, Industrial Truck Association: Annual meeting, Roosevelt Hotel, New York. Association's address: 526 Washington Loan & Trust Bldg., Washington 4, D. C. Managing director: William Van C. Brandt.



SAVE WHEN
THE HEAT IS ON

This 20 pound Ni-Resist casting made for the Schwitzer Corporation by Hamilton Foundry is the turbine casing of a diesel engine turbocharger. Exhaust gases which turn the impeller at speeds up to 90,000 rpm subject the housing to rapid cyclic temperature changes up to 1500° F. Any free scale formed at these temperatures could erode and eventually destroy the impeller blades. Ni-Resist was chosen for this part because it produces practically no free scale, it resists growth and oxidation at high temperatures, and it resists cracking under thermal shock.

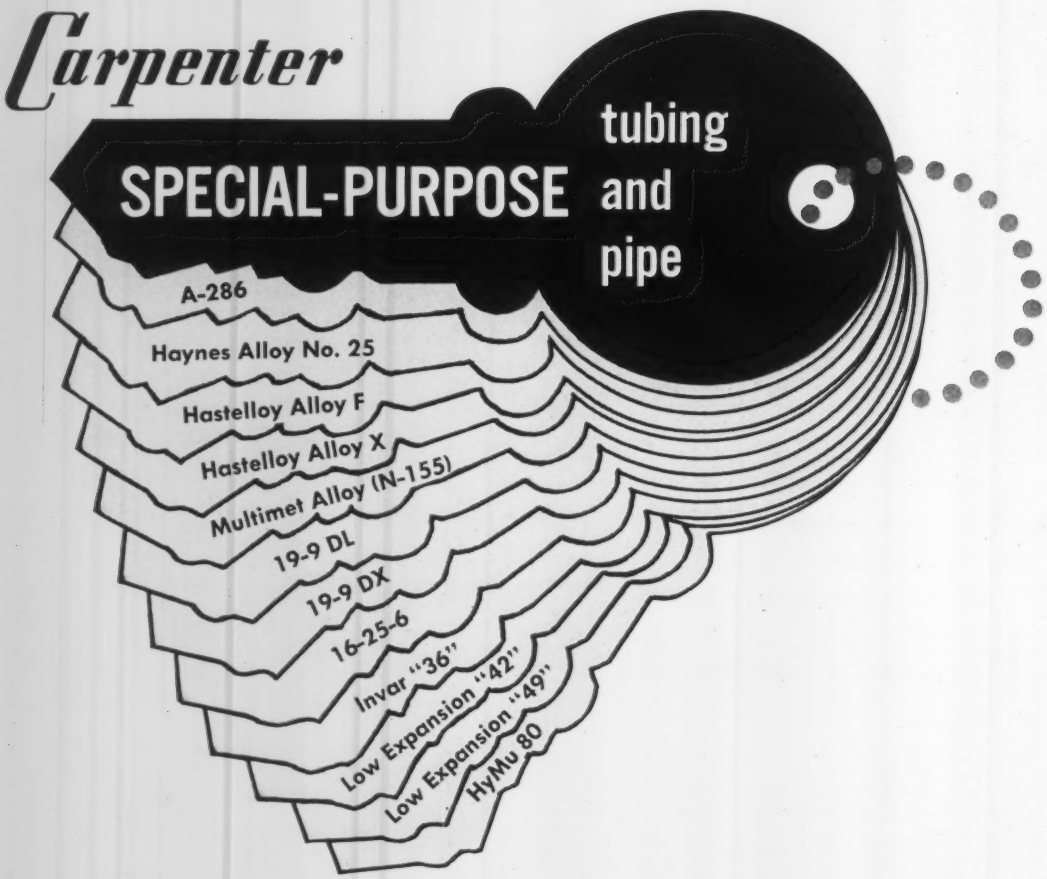
Unit production costs are lowered by finding and using the most efficient material available. In this case, Ni-Resist castings combine design flexibility and machinability with long service life under severe temperature stresses. Ni-Resist castings from Hamilton Foundry have dimensional accuracy, uniform machinability, fine surface finish, a low rejection rate, and are delivered on schedule—a combination of factors which lower unit costs and insure Schwitzer's reputation for product quality.

When new and unusual design problems arise in the selection of metal and the casting of parts, you will find that the skill and integrity of your foundry is your best insurance that specifications—and delivery schedules—will be met.

GRAY IRON • ALLOYED IRON • MEEHANITE ® • DUCTILE (NODULAR) IRON • NI-RESIST • DUCTILE NI-RESIST • NI-HARD

HAMILTON FOUNDRY

The Hamilton Foundry & Machine Co., 1551 Lincoln Ave., Hamilton, Ohio • TW 5-7491



12 master keys to many NEW needs

• As fast as new developments in products and equipment create new needs in tubing and pipe for corrosion and heat control, Carpenter is ready with the answers. Whatever it takes, Carpenter makes . . . to meet the challenge of technological progress.

Listed above are 12 Special-Purpose types of Carpenter tubing and pipe that answer today's needs for high-temperature, low-expansion, high-permeability and corrosion-resistant applications. These super-stainless and high alloy grades meet a broad range of tubing and pipe requirements for vital parts of jet aircraft, missiles, rockets, nuclear energy equipment, instruments, electronic devices, process equipment and other advanced developments. Their properties, recommended uses and other technical data are contained in a new bulletin—T.D. 125.

Write for a copy on your company letterhead. Put your special-purpose requirements for tubing and pipe in Carpenter's capable hands by contacting our nearest office. The Carpenter Steel Company, Alloy Tube Division, Union, N. J.

your master key to cost-savings

special-purpose tubing and pipe

ALLEN HEX-SOCKET SCREWS HEAD

HERE'S ALLEN TODAY!

What this new Allen plant means to you...

If hex-socket screws have any place in your life at all, our new plant at Bloomfield, Connecticut, has unlimited advantages for you!

If you are a distributor of Allen products, for example, this new plant and its expanded facilities for engineering and production mean prompter shipments than we have ever before been able to give you, and both new products for your customers and improvements in existing products—all coming along rapidly now that we have the room we need, and the new equipment we have wanted. If you're an engineer or designer, the modern facilities of this new plant make available to you greatly increased engineering and metallurgical services in the development of dependable fastening for the products you're designing—and higher standards of precision than ever before. If you're a manufacturer, this new plant of ours is bound to be a rich source for new ideas in fastening, and new products that will make your own products better.

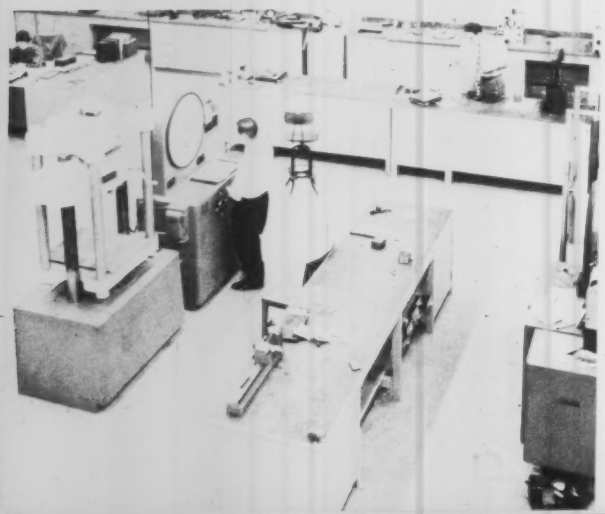
We've picked a few interesting highlights to show you here . . . but there are too many things by far to put on paper! This new plant has to be *seen*.

Malvern J. Mather

MALVERN J. MATHER, *President*.

Allen's Quality Control Division has been greatly expanded. At left, thread form and lead of a socket head cap screw are inspected on a J&L optical comparator. Next is the gage control section. At right, technicians measure pitch diameter by the 3-wire method, to an accuracy of .0001, and inspect surface finish of Allen Dowel Pins to an accuracy of 1 microinch R.M.S.

Ample room to work effectively characterizes every department of this new plant. This section of the new metallurgical laboratory shows two Tinius Olsen tensile machines, and precision testing equipment in the background. The laboratory has a metallograph room, and a special fatigue testing room.



Here's ample room for storing a tremendous inventory of wire and bar stock, so that any type or size is instantly available for processing. A unique conveyor system, designed specially for Allen, handles bar and rod stock.

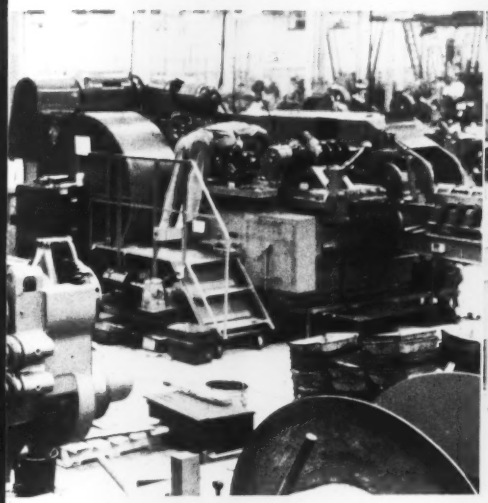
A FEW FACTS ABOUT OUR NEW PLANT . . .

About seven miles from Hartford, our new plant is located on a 32-acre site in Bloomfield, Connecticut, with plenty of room for substantial expansion. The plant comprises a 250,000 square-foot single story factory section, and a two story 20,000 square-foot office building, connected by a glass enclosed corridor that also serves as main entrance and reception room.

The open, almost partitionless, layout of the factory section permits an extremely efficient production flow around the perimeter of the building. A central core within this circular production line provides for service functions, such as quality control and testing, storage, tool cribs, and maintenance.

Layout and construction of the new plant were worked out over a two-year period, with scale models of all equipment. New equipment has all been specially designed for this new plant, to make it the most modern facility anywhere for production of hex-socket screws and related products.

In this section of the large grinding department is a battery of centerless grinders for production of ground thread set screws to Class 3A and special thread fits. Coolants are kept clean by magnetic separators, and precipitrons maintain clean working atmosphere.

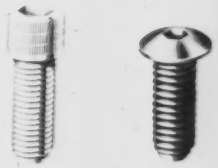


Part of the heading department, where socket screw products are blanked by cold, warm, and hot heading processes. Large machines in foreground are progressive headers for manufacture of large-size socket screw products.

Our new heat treating department was specially engineered for this new plant. Shown are two [illegible] Holcroft units for hardening, quenching and washing, and tempering. Not shown here is new AGF rotary furnace for carburizing dowel pins.

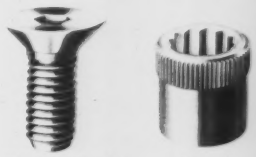
A very large area is allocated to finished products storage, enabling us to make prompter shipment of a wider range of standard stock items. Flow is rapid and direct from these racks, to the shipping department in the rear, and on to the large truck dock just beyond.

These precision products have made ALLEN the number 1 name in the socket screw field!



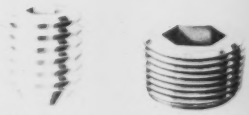
Leader Point Cap Screw

Allen Button Head Cap Screw



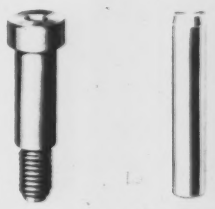
Allen Flat Head Cap Screw

Allenut



Allenpoint Set Screw

"Tru-Round" Pipe Plug

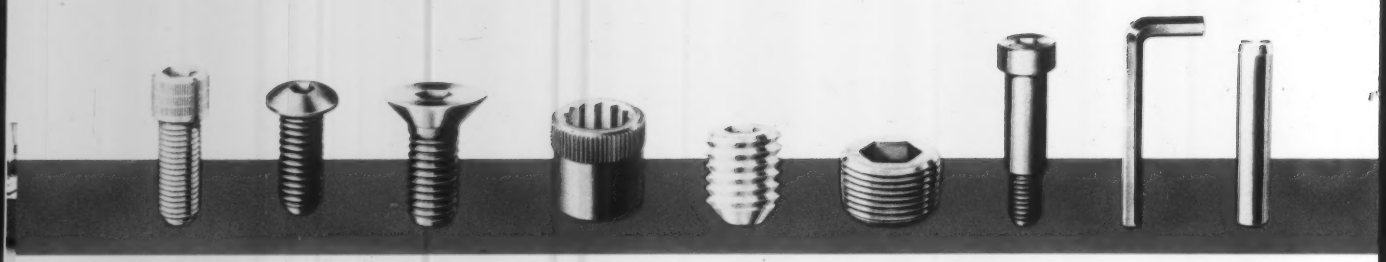


Allen Shoulder Screw

"Tru-Ground" Dowel Pin

Allen Hex Key

ALLEN
HEX-SOCKET SCREWS
HEAD



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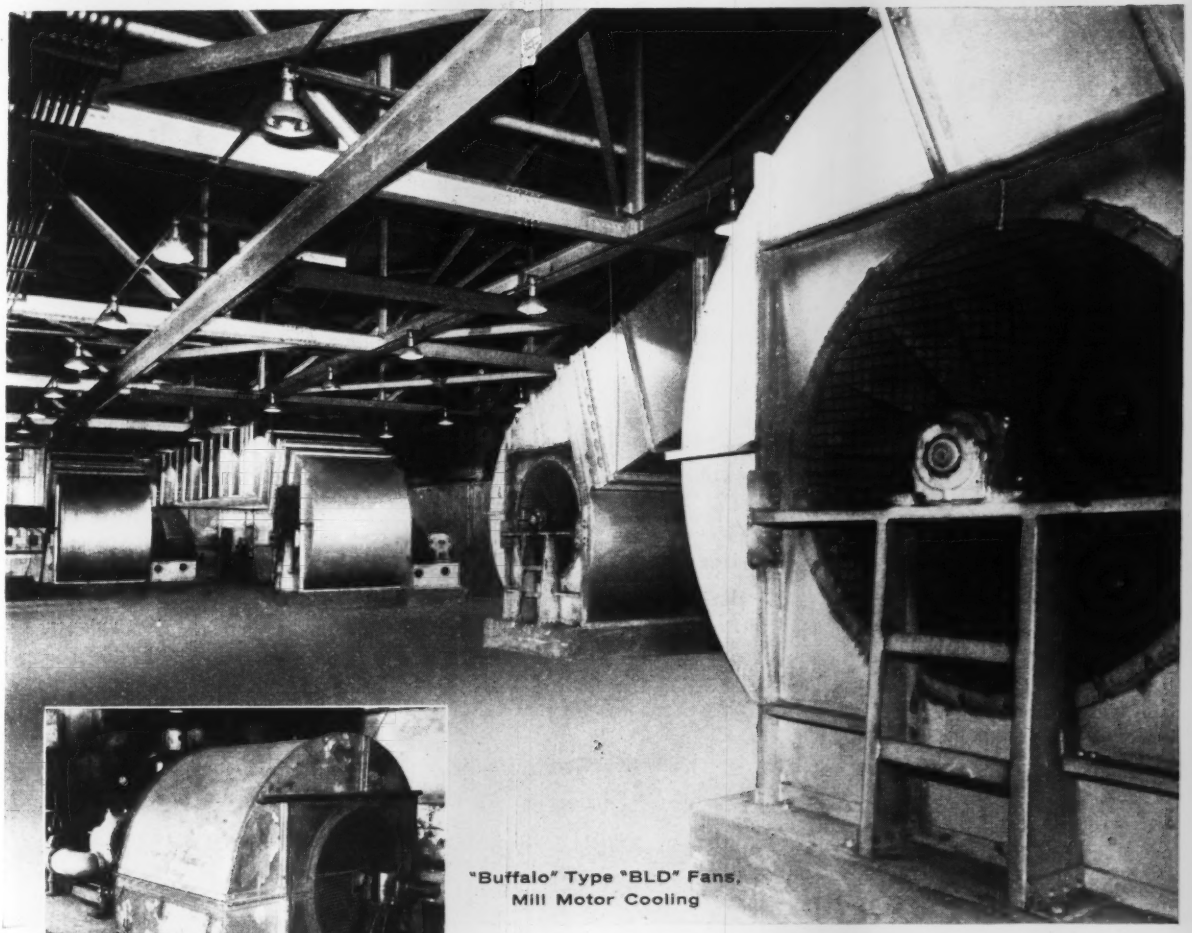
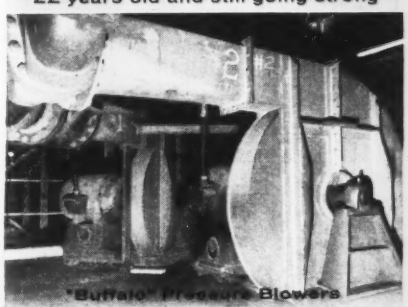
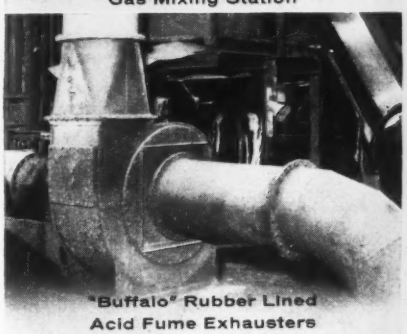


"Buffalo" Type "BLD" Fans, Mill Motor Cooling

"Buffalo" Forced Draft Fan 22 years old and still going strong



"Buffalo" Pressure Blowers Gas Mixing Station



"Buffalo" Rubber Lined Acid Fume Exhausters

FROM MILL MOTOR COOLING TO ACID FUME EXHAUST

Weirton Steel Company Uses "Buffalo" Fans

By their very nature, fans and other air handling units manufactured by the Buffalo Forge Company are ideally suited to steel mill work. The Weirton Steel Company, division of National Steel Corporation, Weirton, West Virginia, discovered this over 40 years ago and have been using "Buffalo" units ever since. Today, they have "Buffalo" fans for open hearth combustion air, mill motor cooling, pressure blowers for gas mixing, rubber lined fans for acid fume exhaust, boiler forced draft fans, central heating system fans and over 200 unit heaters. You, too, will be more than satisfied with "Buffalo" air handling units. There is probably a type and size to fit every application in your plant.

The next time you want to handle air, call your nearest "Buffalo" Engineering Representative. Or write for the information you need.

BUFFALO FORGE COMPANY

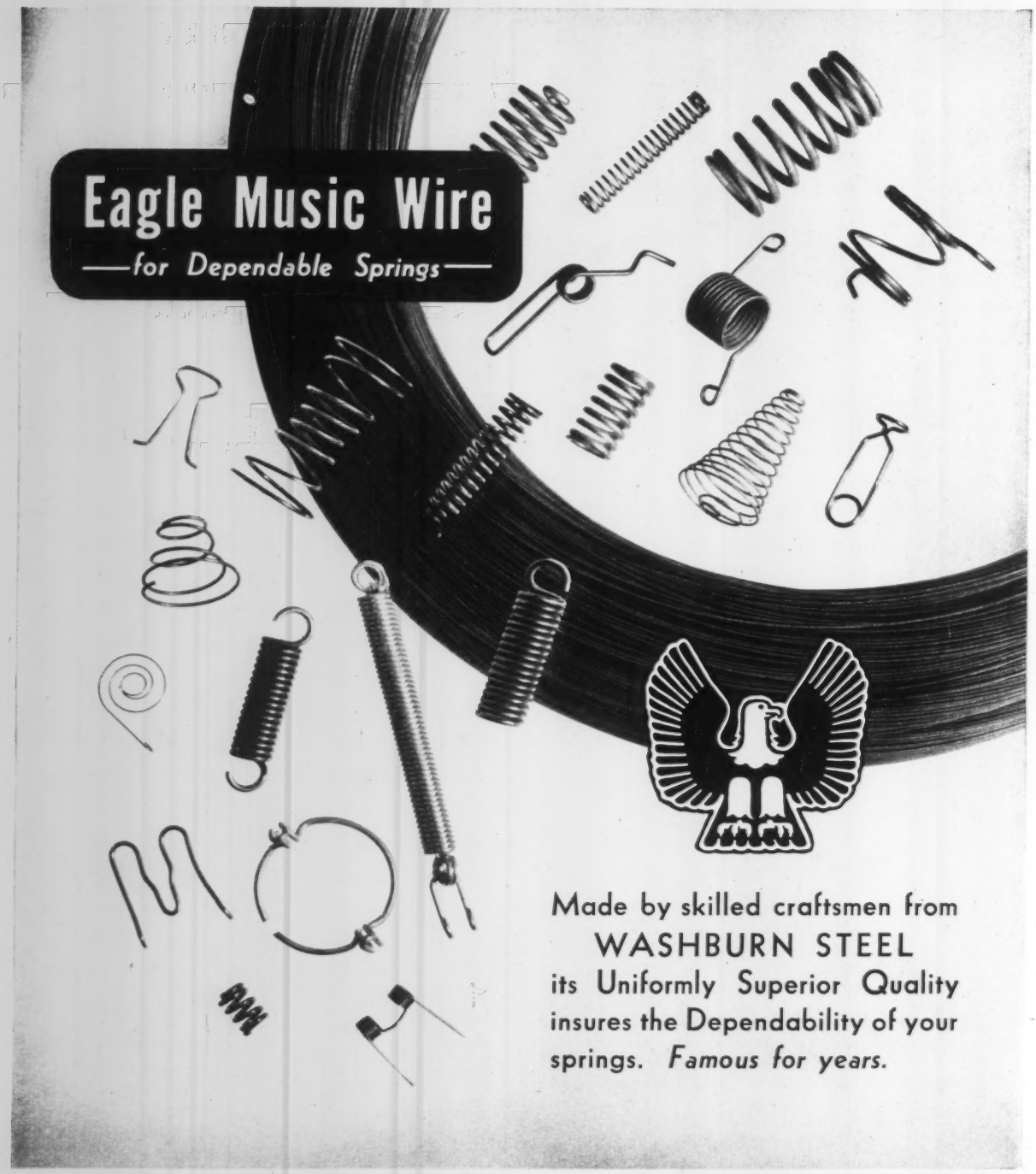
Buffalo, N. Y.

"Buffalo"

Buffalo Pumps Division • Buffalo, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

VENTILATING AIR CLEANING AIR TEMPERING INDUCED DRAFT
EXHAUSTING FORCED DRAFT COOLING HEATING PRESSURE BLOWING



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its Uniformly Superior Quality
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springs. *Famous for years.*

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WASHBURN

WASHBURN WIRE COMPANY, NEW YORK CITY
CLEAN, UNIFORM BILLETS–STRIP–RECTANGULAR, ROUND, FLAT RODS
TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

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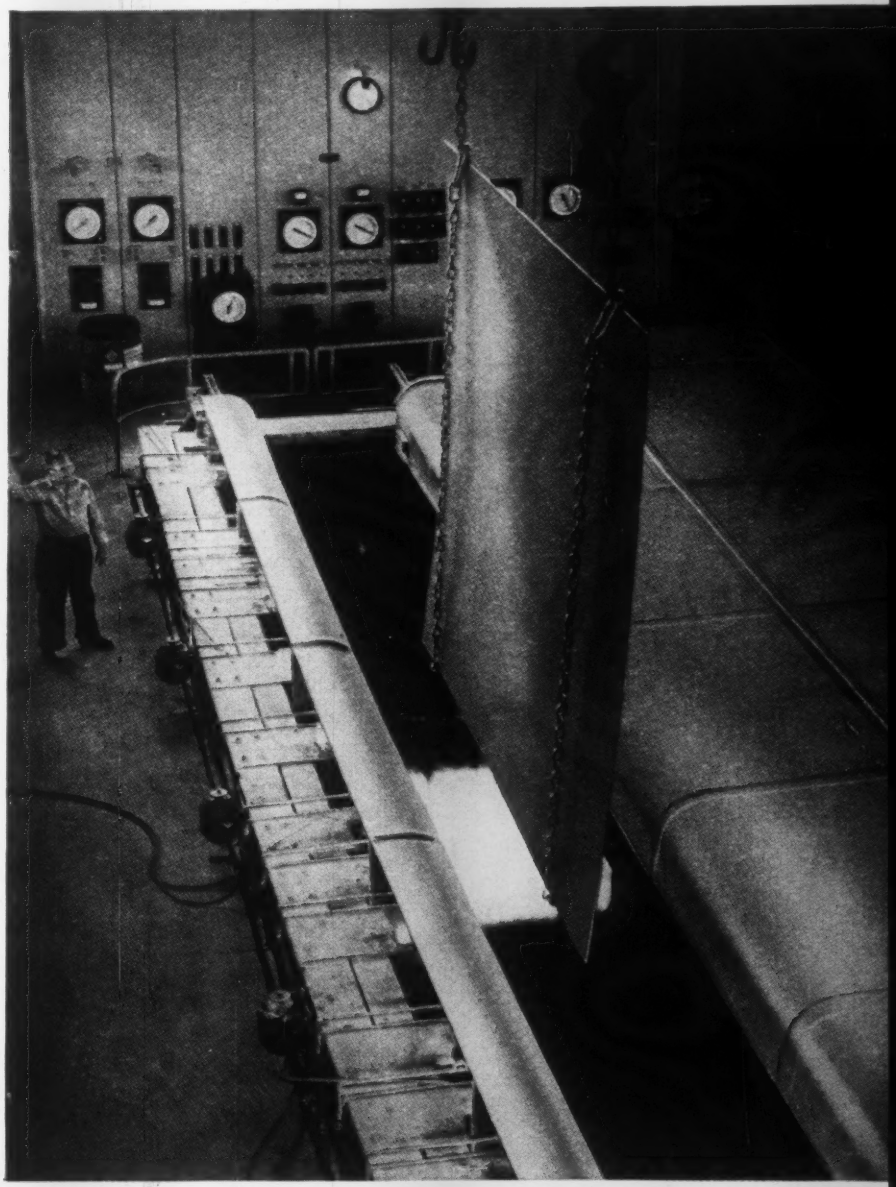
BASIC CHEMICALS FOR METALS

look to General Chemical!



Here's why . . .

At practically every stage of metal-making and metal-working, you will find need for basic chemicals produced by General Chemical. These chemicals are readily available from a nationwide network of plants and conveniently located stock points. You're sure of uniform quality, prompt deliveries, and experienced technical service whenever you need it. So specify *General* for all these basic chemicals:

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Potassium Fluoborate
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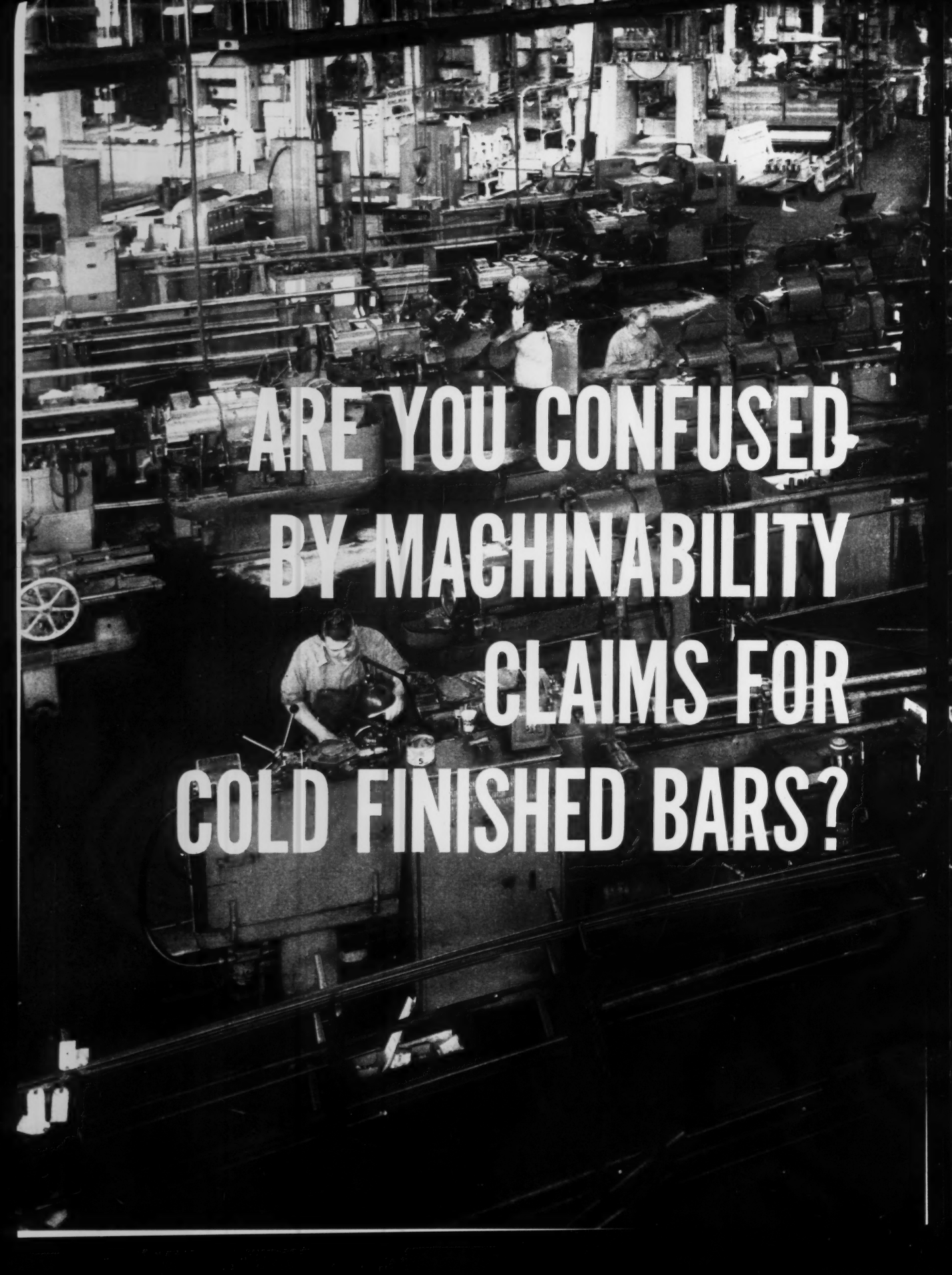

ARE YOU CONFUSED
BY MACHINABILITY
CLAIMS FOR
COLD FINISHED BARS?

What Are the Facts About Machinability?

Conflicting claims unfortunately are sometimes made for the machinability of certain cold finished steel bars. The result is that knowing minds tend to be skeptical about all specific machinability claims.

MACHINABILITY A RELATIVE TERM

And rightly so, for "machinability" is a relative term. Machinability is defined at Bliss & Laughlin as the machining characteristic of the steel which most economically fits your product and production. Four considerations determine the degree of free machining which should be sought: (1) The cost of the finished part, (2) the rate of production possible, (3) the finish required and (4) the tool life wanted.

WHICH STEEL IS MOST MACHINABLE?

It is clear that no one of the so-called "highly machinable" steels can always be recommended for all production. Instances have been noted, for example, where plain carbon steels are better machinability buys than leaded steels, which are recognized as being the freest machining of all steels. When asked which steel should be purchased for its machinability characteristics, we must say "that depends on your product and your equipment."

CONSERVATIVE MACHINABILITY CLAIMS

During the nearly 70 years which Bliss & Laughlin has served American industry, the company has been notoriously conservative about machinability claims. As America's largest specialized producer of cold finished steel bars, Bliss & Laughlin recommends the steel which provides *the best machinability at the best price for the part to be produced on your equipment.* Available for your production needs is a complete range in all grades of carbon and high carbon steels, regular and leaded, alloys and heat-treated steels. Bliss & Laughlin is prepared at all times to meet your specifications without equivocation.

MACHINABILITY EXPERTS AVAILABLE

Because Bliss & Laughlin has no favorite analysis to promote, offering all analyses, its machinability advisory service can be particularly valuable during both planning and actual production. Bliss & Laughlin's machinability engineers are available to trouble-shoot existing machinability problems in your plant or to provide metallurgical and technical assistance in helping you select the most economical grade of steel before jobs are started.

There will be no confusion about machinability claims if you place your problem in the hands of a Bliss & Laughlin representative. If he doesn't have a ready answer, a Bliss & Laughlin machinability engineer will. Check the telephone classified pages for the nearest representative or write or telephone the nearest plant below.

A. D. Kondrath (left), a B&L Machinability Engineer, is one of the country's authorities on the machinability of cold finished steel bars. Typical of his work with customers is pre-production selection of the most machinable bar stock for the job, considering the finish desired, the rate of production possible, and the tool life.

A practical recommendation is always assured because Bliss & Laughlin backs its recommendations with actual tests on its own machine tool in B&L's Customer Service Laboratory. Here Mr. Kondrath is discussing the machinability of the steel recommended as being the most suitable for a customer's product and production.

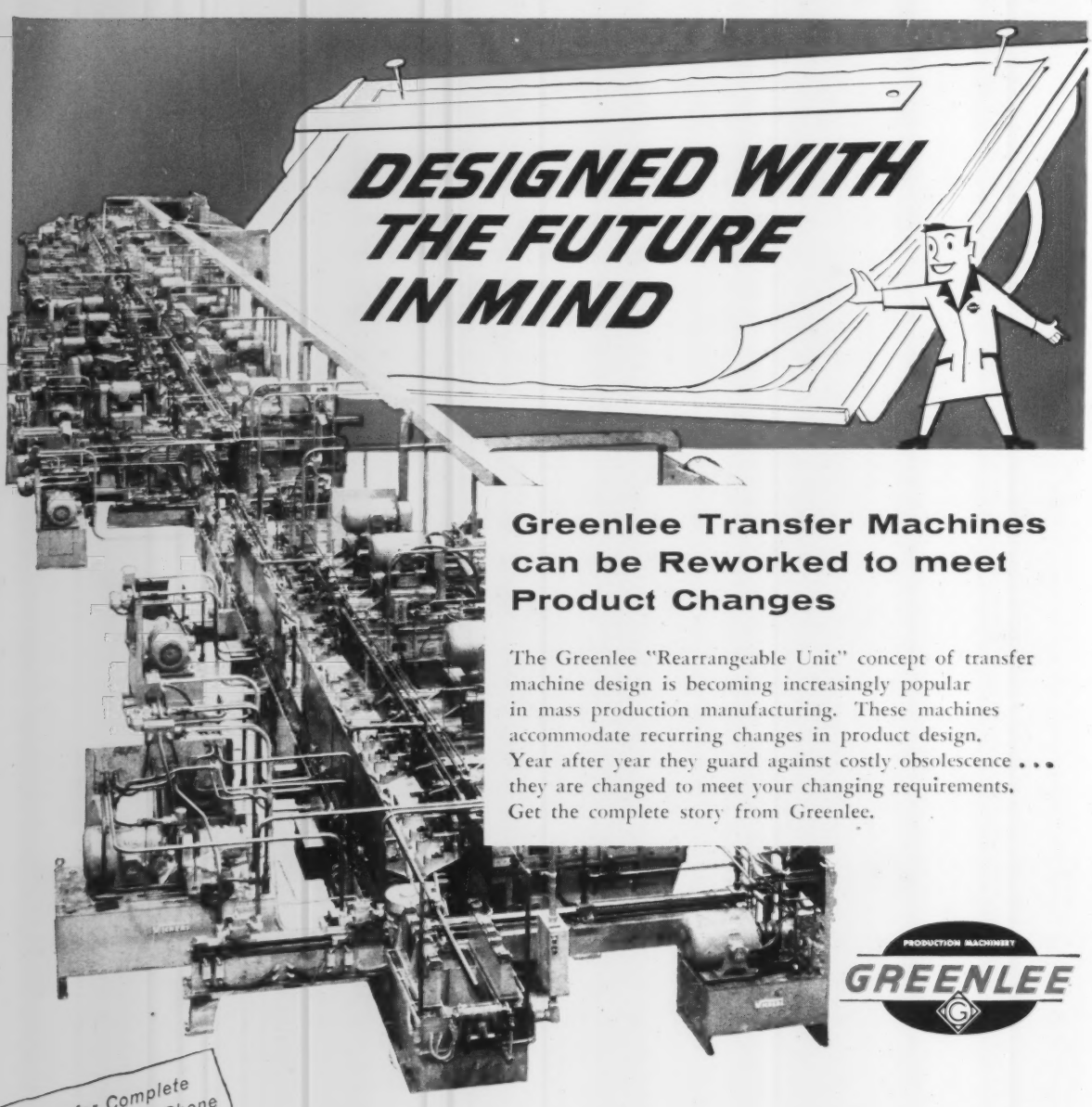
After a customer receives the B&L steel recommended as being most machinable for the part on the machine tool which will be used, there is continuous assurance that production will run smoothly and that the finished part will meet specifications—very important reasons why B&L machinability recommendations are worth seeking.

Specialists in Finish, Accuracy, Straightness, Strength and Machinability

BLISS & LAUGHLIN

GENERAL OFFICES: Harvey, Ill. • PLANTS: Harvey, Detroit, Buffalo, Mansfield, Mass.

Largest Independent Producer of Cold Finished Steel Bars



Greenlee Transfer Machines can be Reworked to meet Product Changes

The Greenlee "Rearrangeable Unit" concept of transfer machine design is becoming increasingly popular in mass production manufacturing. These machines accommodate recurring changes in product design. Year after year they guard against costly obsolescence . . . they are changed to meet your changing requirements. Get the complete story from Greenlee.

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- Multiple-Spindle Drilling and Tapping Machines
- Six and Four-Spindle Automatic Bar Machines
- Hydro-Borer Precision Boring Machines
- Core Box Rollover and Draw Machines
- Specialized Woodworking Machines
- Hand Tools for Woodworking
- Tools for Woodworking Machines
- Hydraulic Tools for Electricians, Plumbers, Contractors

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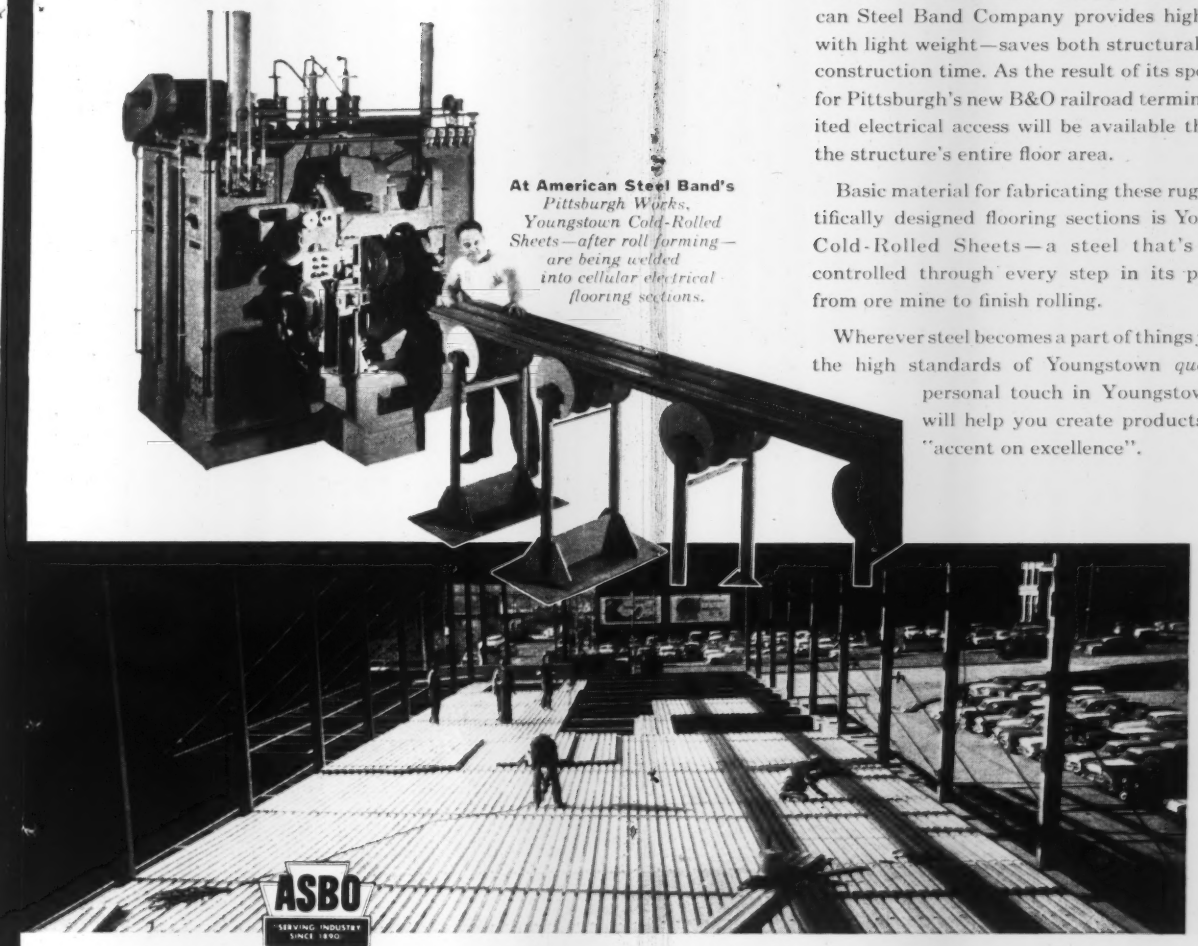
Youngstown cold-rolled sheets



At American Steel Band's *Pittsburgh Works, Youngstown Cold-Rolled Sheets—after roll forming—are being welded into cellular electrical flooring sections.*

Cellular steel electrical flooring produced by American Steel Band Company provides high strength with light weight—saves both structural steel and construction time. As the result of its specification for Pittsburgh's new B&O railroad terminal, unlimited electrical access will be available throughout the structure's entire floor area.

Basic material for fabricating these rugged scientifically designed flooring sections is Youngstown Cold-Rolled Sheets—a steel that's quality-controlled through every step in its production from ore mine to finish rolling.

Wherever steel becomes a part of things *you* make, the high standards of Youngstown *quality*, the personal touch in Youngstown *service* will help you create products with an "accent on excellence".

ASBO
SERVING INDUSTRY SINCE 1890

QUALITY YOUNGSTOWN SERVICE

THE
YOUNGSTOWN
SHEET AND TUBE COMPANY
Youngstown, Ohio

Manufacturers of Carbon, Alloy and Yoloy Steel

expensive part thread-rolled and burnished

. . . with no spoilage

Specifications required that threads be rolled and thread relief burnished after heat treat on this highly critical, highly stressed aircraft jet engine mounting made by Liston Grinding Company, Tonawanda, New York.

Both operations were performed between centers on the same LANHYROL Machine with the same work-holding fixture. The plastic deformation and cold working of the thread rolling process vastly improved the tensile strength and fatigue resistant properties of the part. The material was 4340 steel at a minimum hardness of 40 Rockwell "C" to assure a tensile strength of 180,000 to 200,000 PSI.

Prior to the LANHYROL operations, each part contained many hours of manufacturing time. Because of this accumulated cost, it was essential that burnishing and rolling be accomplished with minimum scrap. Of the entire lot of parts rolled to date, not one has been spoiled in either rolling operation, including those used in setting up the machine.

Neck diameter and radius adjacent to the thread had to be burnished

The roll-burnishing operation (figures 2 & 3) preceded the threading operation and was for the purpose of increasing the fatigue resistant properties of the material by cold working plus the reduction of any stress-raising grinding tool marks. The surface burnished had to include the entire .130 radius, the .6954 neck diameter and the .02 radius adjacent to the thread. First, the surfaces were ground to a surface finish approximating 20 micro-inches before roll-burnishing. Then roll-burnishing was performed at a roll-pressure of 25,000 pounds to result to a 4/6 micro-inch finish. The workpiece ran at a speed of 480 RPM and the dies were in contact with the workpiece for 1.5 seconds.

All threads produced with a pitch diameter variation of less than .0005″

After roll-burnishing, the $^{3}/_{4}$″ — 16 UNF—1.03″ long threads were rolled (figures

figure 1

Jet Engine Mounting—burnished and thread rolled by the LANHYROL Machine

526C

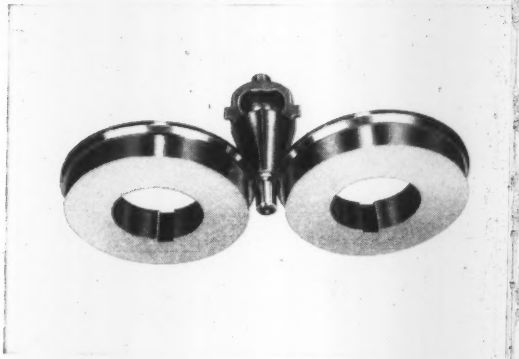


figure 2

Simulated machine set-up for roll burnishing

4 & 5) at a workpiece speed of 1320 RPM. The thread rolling dies were in contact with the workpiece for only .24 of a second. *All threads were produced to near-perfect concentricity with a pitch diameter variation of less than .0005".*

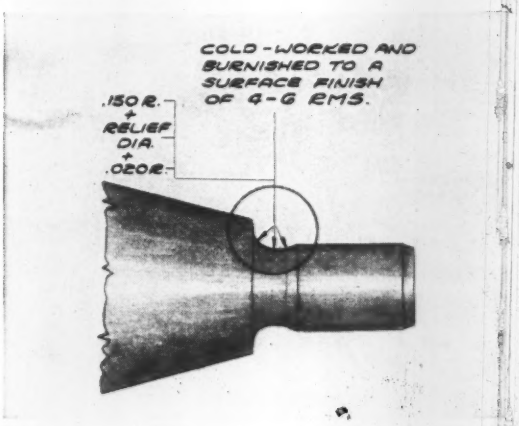


figure 3

Drawing illustrating roll-burnishing operation

High Production • Accuracy
Wide Range • Flexibility

This LANHYROL operation is but one of the many producing outstanding results.

Production data from these installations prove the unequalled productivity and dependability of this versatile machine.

The LANHYROL Thread Rolling Machine produces strong, accurate threads of excel-

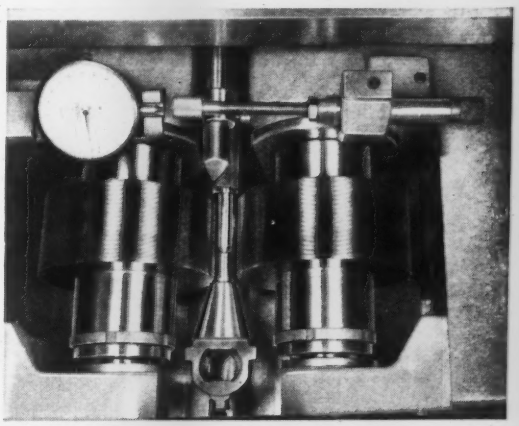


figure 4

Machine set-up for thread rolling

lent finish by any one of four rolling methods —Thrufeed, Infeed, Continuous or Reciprocal. It will thread all diameters from "0" to 3", producing left and right hand threads of all types, including UNC, UNF, Acme, worm and many special forms.

Additional information on request — please send specifications and ask for Bulletin E-60.

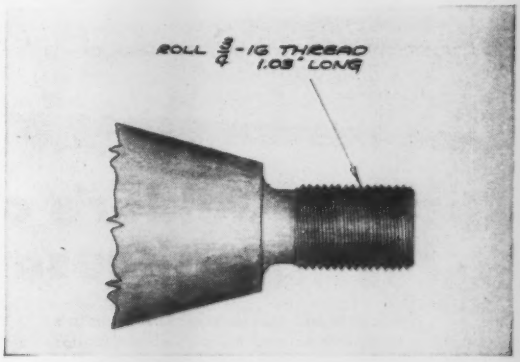
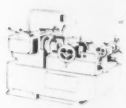


figure 5

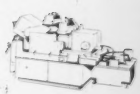
Drawing illustrating thread rolling operation

LANDIS *Machine* COMPANY
WAYNESBORO • PENNSYLVANIA
THE WORLD'S LARGEST MANUFACTURER OF THREADING EQUIPMENT

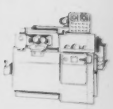

Threading Machines

Die Heads—Rotary & Stationary

Taps—Collapsible & Solid Adjustable


Centerless Thread Grinding Machines

Thread Rolling Tools


Thread Rolling Machines

Weldynamics

ARC WELDING AT WORK CUTTING COSTS

I found that with Jetweld LH-70 electrodes, no matter what you weld, you can be sure of the job.

Andrew Wantuck
Capreol, Ontario

I welded 4000 feet of 4" pipe with Fleetweld 5-P. I found it the perfect rod for stringer, hotpass, fill and cover pass.

Also, I had the cleanest nick break that I ever had in a test using Fleetweld 5-P.

Ted Lee Regan
La Crescenta, California

I just renewed my Navy arc welding certificate with Fleetweld 7 and I passed with flying colors. Most of this work is secret, but it's no secret that Lincoln products are doing their part in this field.

Golin E. Noel
Redondo Beach, California

Your weldor's opinion is worth a thousand words

For data and specifications on Lincoln's complete line of mild steel electrodes write us and request Bulletin 7000.1.

The World's Largest Manufacturer of Arc Welding Equipment

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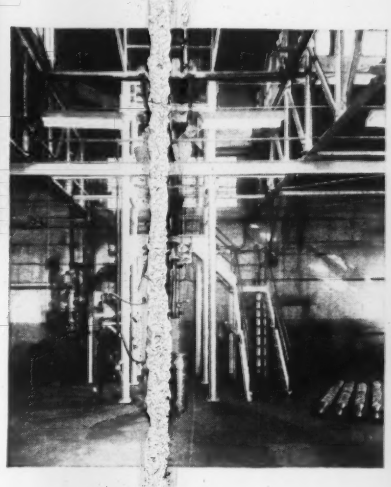
THE LINCOLN ELECTRIC COMPANY, DEPT. 1646, CLEVELAND 17, OHIO

Firth Sterling ...

PIONEER IN POWDER AND MOLTEN METALLURGY

AIR ARC



CONSUMABLE ELECTRODE
(STERCON)

INDUCTION VACUUM
(STERVAC)

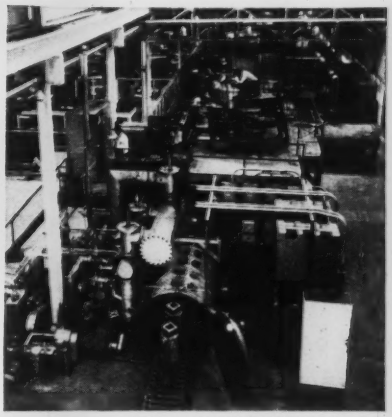


Photo courtesy Kolcast Industries, Inc.

Using Three Basic Melting Methods

to produce tougher high temperature alloys

Firth Sterling metallurgists have exceptional experience in *all three* basic melting methods—air arc, consumable electrode (STERCON) and induction vacuum (STERVAC)—used to produce high temperature alloys and super alloys to specification for the aircraft and missile industry. This unique combination of experience and facilities is available to you in developing high temperature materials with the purity, quality and mechanical properties essential to your applications.

For over 68 years, Firth Sterling has pioneered the development of tougher, more heat-resistant metals. The critical high temperature alloys produced for jet engine applications such as buckets, turbine wheels, shafts, compressor wheels, casings and blades, and structural rings and support members, are examples of Firth Sterling metallurgical achievements in meeting *today's* requirements. This valuable experience, capacity and technological "know how" are being applied to STERCON and STERVAC super alloys as well as basic metals such as Zirconium.

* * *

For your high temperature alloy requirements involving quality and exceptional mechanical properties call on our practical metallurgical experience and modern melting facilities. Your Firth Sterling representative will give you complete information. Firth Sterling, Inc., Dept. 81F, 3113 Forbes St., Pittsburgh 30, Pa.

"Your Future is Great in a Growing America"

PRODUCTS OF Firth Sterling METALLURGY

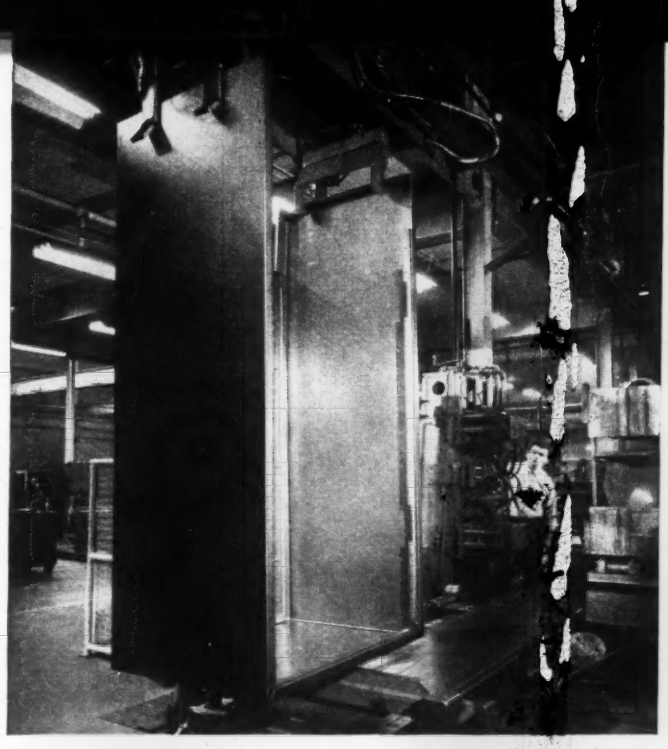
FIRTH STERLING TRADE MARK

HIGH SPEED STEELS • TOOL & DIE STEELS • STAINLESS SPECIALTIES • HIGH TEMPERATURE ALLOYS
SINTERED TUNGSTEN CARBIDES • HEAVY METAL • CERMETS • CHROMIUM CARBIDES
ZIRCONIUM • STERVAC & STERCON SUPER ALLOYS

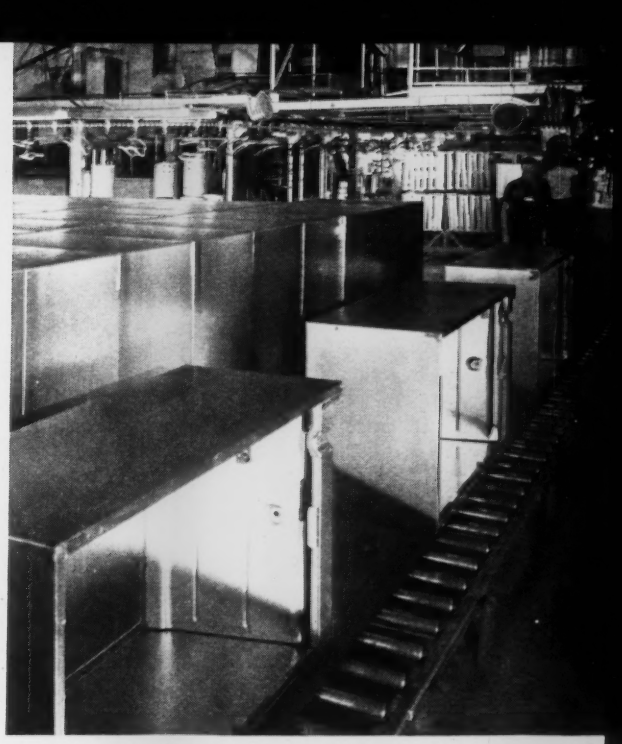
PITTSBURGH STEEL'S cold-rolled sheet passes critical surface inspection as . . .

The 3 F's in Pittsburgh Steel's Sheets Keep Automated Lines Rolling at Westinghouse

STEEL that is free of flaws is vital to the gleaming painted surface of finished refrigerator.



COMPLETELY FORMED by automated equipment, refrigerator's shell then moves to welding operation.



3 F's—Flatness, Finish, Formability—show up here as outer shells await painting.

"If we made 75 a day then, we were really going. Now, we're geared up here to make more than twice that in an hour."

That quote came from a veteran production man at Westinghouse Electric's huge and humming Appliance Division plant near Columbus, Ohio.

The difference between daily production of 75 refrigerators (in 1927) and today's rate is explained by just one word—automation.

Production of the refrigerator's steel shell is automated completely through welding. This includes some 15 distinct operations required to convert smooth, precisely dimensioned cold rolled sheet steel into the outer shell of a home refrigerator.

Part of Westinghouse's ability to use advanced production methods is due to the steel available from suppliers like Pittsburgh Steel Company.

H. L. Johnson, the plant's purchasing agent, and Joseph A. Scattoloni, staff supervisor of manufacturing engineering, agree that automation places special responsibilities on their steel suppliers. As Mr. Scattoloni puts it:

"Westinghouse built its reputation on quality products, but we can't build quality when it isn't in the materials to start with."

Pittsburgh Steel knows—even without automation to consider—that sheet going into appliances must have the Three F's—Flatness, Finish and Formability. Add requirements of automation and you need these same qualities, but more so. Here's why they're so vital.

• **Dimensional accuracy**—A variation of as little as .005 inch could compound into a total error large enough to interrupt production, scrap a shell or both.

To produce a shell, automatic equipment has to make six 90-degree bends, as well as a smaller seventh one. If the sheet isn't flat or if it lacks uniform temper, bends can be thrown off.

Once bends are made, the sheets can't be allowed to spring back. Over-bending, too, will scrap a shell. That gets costly when you consider that the shell—at about 94 pounds—is the largest single item in the 140-150 pounds of steel per finished refrigerator.

If the sheet isn't flat, waviness will show up glaringly in the finished shell, or it could cause an "oil-canning" effect. This poses a threat to the painted surface.

If camber isn't within specific limits, sheets can't be held properly during blanking and punching. Holes creep beyond tolerances, ultimately scrapping the shell.

• **Surface finish**—Since the shell must take a uniform and critical painting, surface finish is all-important.

Rust, scale, piping, pits—singly, or in combination—can ruin a shell, so Pittsburgh Steel knows why flaw-free steel is a must.

• **Formability**—Another name for shapeliness—is more vital in automatic forming than in a hand operation. And strain marks resulting from improperly bent sheet will require either complete scrapping or correction by expensive hand machine methods.

Westinghouse stakes its reputation on quality of its products. A supplier who can provide Westinghouse with this quality can meet your needs, too. The full range of hot-and-cold rolled sheet and strip, produced exactingly on the steel industry's finest mill equipment—is as close as your telephone. Call any of the Pittsburgh Steel Company district sales offices listed here. Do it today!

Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

District Sales Offices

Atlanta	Cleveland	Dayton	Los Angeles	Pittsburgh
Chicago	Dallas	Detroit	New York	Tulsa
		Houston	Philadelphia	Warren, Ohio

Another fine product gains NEW S.A. By Switching to the Saginaw Screw*

WORLD'S MOST EFFICIENT ACTUATOR LIFTS 450 LB. FERGUSON TRAIL RAKE CAGE WITH 75% LESS EFFORT

Massey-Ferguson engineers wanted "something better" than the old-fashioned acme screw in the manual mechanism for adjusting rake cage height in their new Trail Rake "36". They found what they wanted in the Saginaw Ball Bearing Screw. It cuts cranking effort 75%—and since it needs *no lubrication,* it's never fouled by clinging dirt. They figured the Saginaw Screw would add extra ***S**ales **A**ppeal—and they were so right. Dealers report farmers love it!

The Saginaw Screw converts *rotary* motion into *linear* motion with close to 100% efficiency. That's why alert manufacturers are saving so much effort, power, weight, space and cost by simply switching from inefficient acme screws and costly hydraulics to these amazingly versatile Saginaw Screws.

We're already building them in sizes from 1½ *inches* long for delicate electronic controls to 39½ *feet* long for monster machinery. So if your products (no matter how big or small) use any kind of actuation device, Saginaw Screws may give them that vital new **S**ales **A**ppeal you're looking for now.

Just send us your catalog and our expert engineers will gladly suggest any possible applications. Saginaw Steering Gear Division, General Motors Corporation, Saginaw, Michigan—world's largest builders of b/b screws and splines.

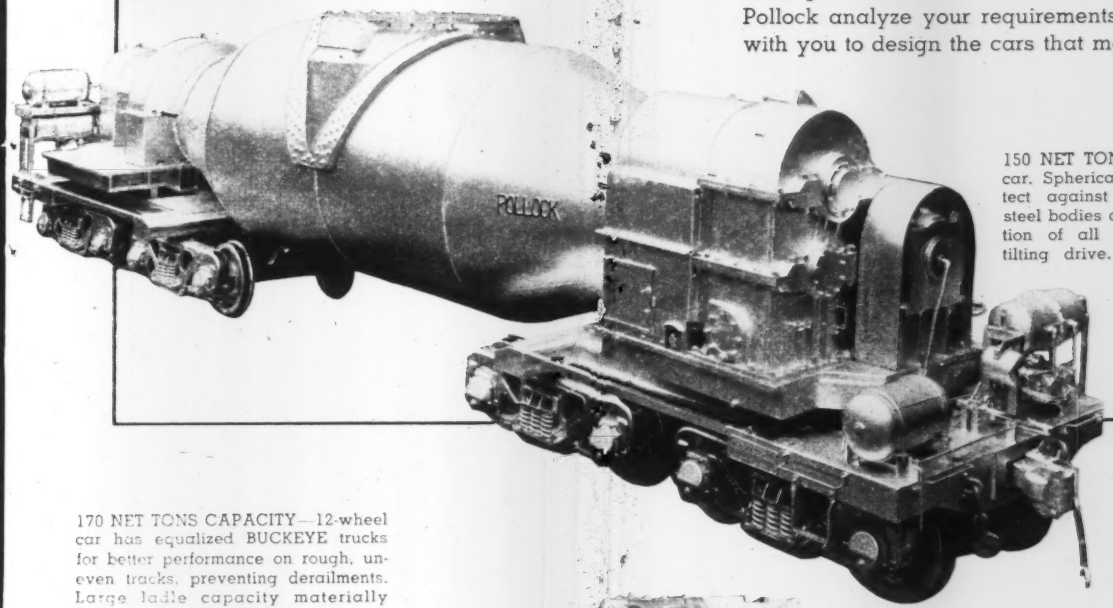
Give your products NEW SALES APPEAL... switch to the **Saginaw**

WORLD'S MOST EFFICIENT ACTUATION DEVICE

ball bearing Screw

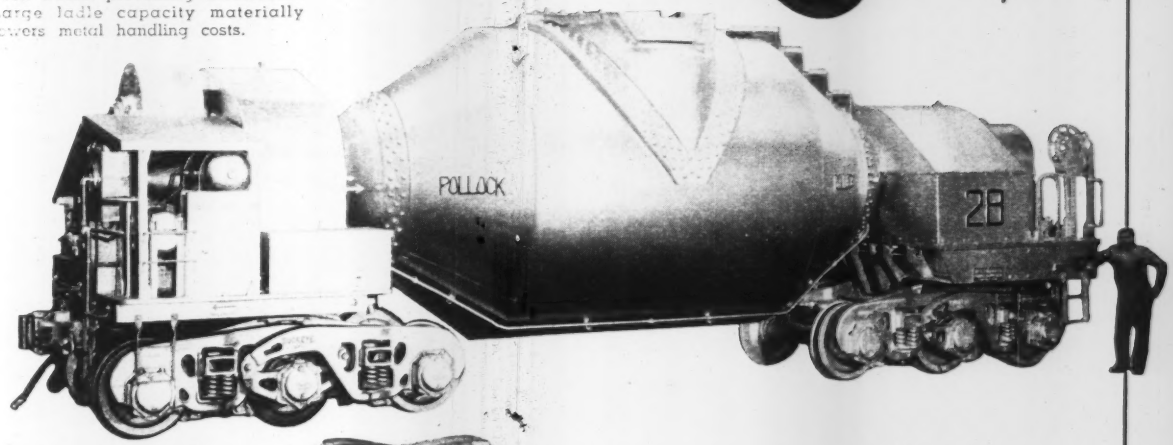
POLLOCK hot metal cars

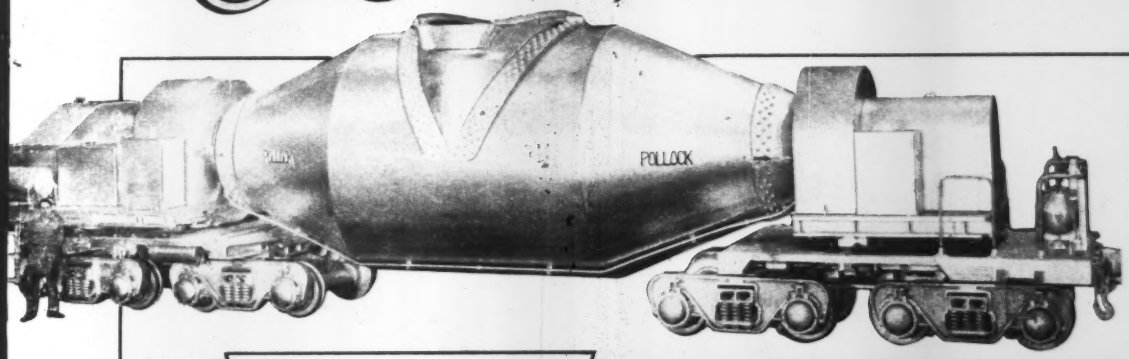
These are America's newest, BIG, hot metal cars. Pollock designed and built this type car to carry large tonnages and reduce hot metal handling costs. Have Pollock analyze your requirements. Pollock will work with you to design the cars that meet your needs best.



150 NET TONS CAPACITY—16-wheel car. Spherical trunnion bearings protect against misalignment. Welded steel bodies and ladles. Pump lubrication of all gears and bearings in tilting drive.

170 NET TONS CAPACITY—12-wheel car has equalized BUCKEYE trucks for better performance on rough, uneven tracks, preventing derailments. Large ladle capacity materially lowers metal handling costs.





200 NET TONS CAPACITY—America's largest. Dumping mechanism is completely covered. Car designed to meet specific plant conditions. Air brakes if desired.

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SINCE 1863

THE WILLIAM B. POLLOCK COMPANY
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Associated in Great Britain with Ashmore, Benson, Pease & Co.

STEEL PLATE CONSTRUCTION • ENGINEERS • FABRICATORS • ERECTORS

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Roebling Presents

THE NEWEST CONCEPT IN WIRE ROPE

*Herringbone**

two ropes in one!

Here is a combination that has proved itself during three years of field testing. A welcome addition to Roebling's great line of wire ropes, Royal Blue *Herringbone* is both a regular lay and lang lay wire rope!

So, in one rope you have the greater flexibility and abrasion resistance of lang lay construction *plus* regular lay's superior stability under severe operating conditions.

Preformed Herringbone is made of two *pairs* of lang lay strands, and two strands of regular lay which separate the two pairs of lang lay—all of it made of Type 1105 rope wire.

For three years Herringbone has been used for general hoisting, holding and closing lines, shovel ropes, wagon scraper ropes and dragline ropes. Without reservation, its performance has been superior to that of any other rope used for the same jobs . . . even in the hands of inexperienced personnel! *Its proven capabilities clearly suggest its use for all jobs where steel core ropes are normally used.*

See your Roebling salesman for all the facts or write Wire Rope Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey. Roebling Herringbone, the two-in-one rope to meet the *doubly* stringent demands of today's economy.

ROEBLING

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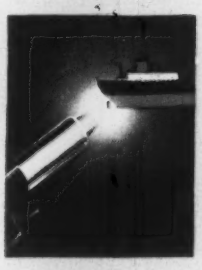
Subsidiary of The Colorado Fuel and Iron Corporation

**Reg. app. for*

HERRINGBONE
WIRE ROPE

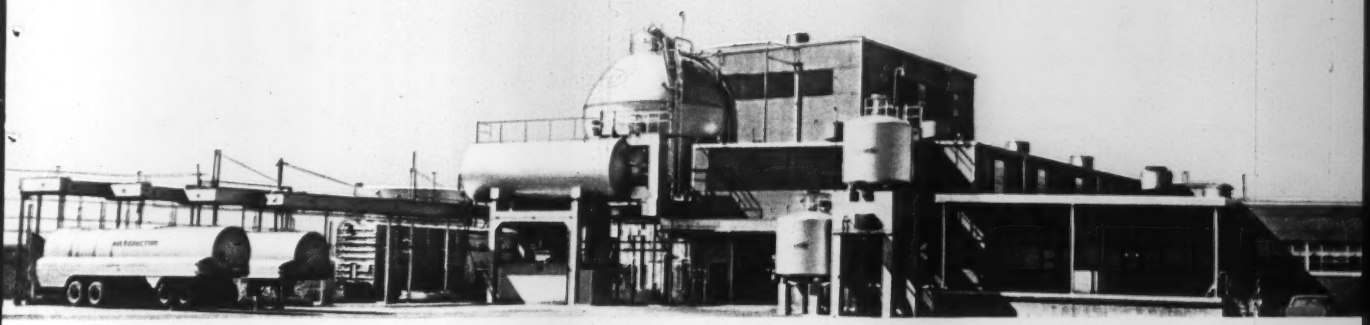
INDUSTRIAL GASES... NATIONWIDE... FROM AIRCO



Air Reduction gases, among them oxygen, nitrogen, argon, hydrogen, helium and carbon dioxide are vital commodities in the metal-working industries.

In other industries, too, Air Reduction gases are playing an important role—food processing, electronics, steel, aircraft and missiles, and chemicals.

To all industries, Air Reduction supplies gases in whatever quantity needed, and in whatever form—gaseous or liquid. (Except hydrogen—available in gaseous form only and helium also available in liquid form currently on West Coast only, elsewhere in gaseous form.) Air Reduction industrial gas specialists, with years of practical experience and technical training, are at your service to help you make the most efficient use of industrial gases. Ask the Airco representative in your vicinity to show you why your gas requirements are best served by Air Reduction.



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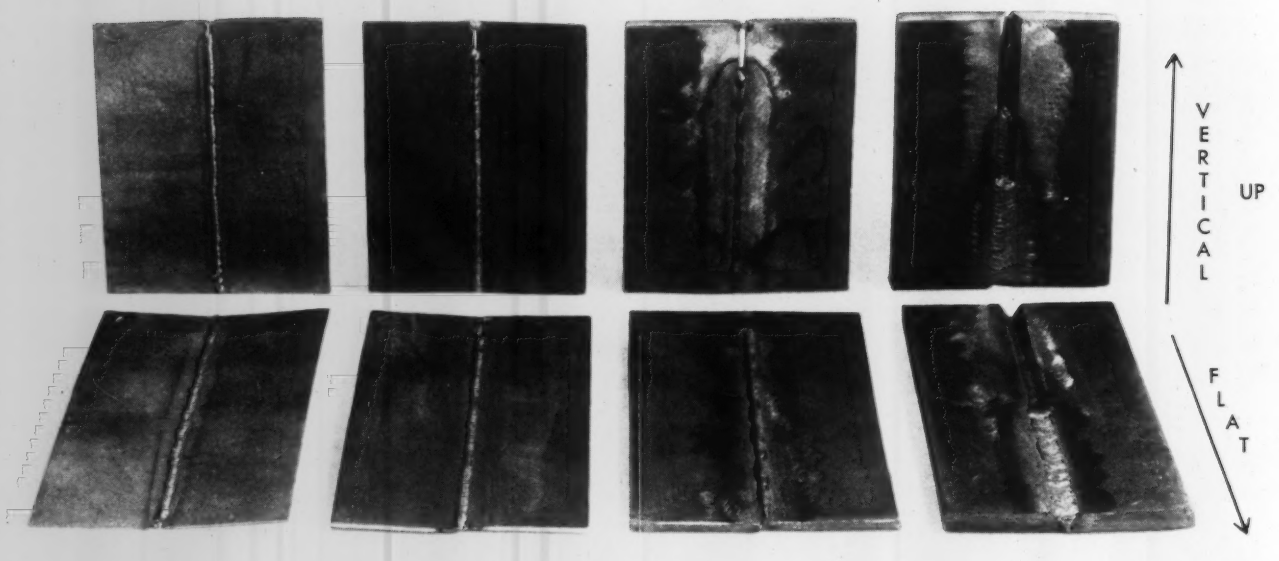
THIN to **THICK**



VERTICAL UP – 14 ga. sheet – Square butt – One pass – 1/32" Root opening – Welding speed 10 IPM.

FLAT – 1/16" sheet – Square butt – One pass – 1/32" Root opening – Welding speed 10 IPM.

VERTICAL UP – 1/8" plate – Square butt – One pass – 1/16" Root opening – Welding speed 9 IPM.

FLAT – 1/8" plate – Square butt – One pass – 1/16" Root opening – Welding speed 10 IPM.

VERTICAL UP – 1/4" plate – Square butt weld – One pass – 3/16" Root opening – Welding speed 3.25 IPM.

FLAT – 1/4" plate – Square butt weld – One pass – 3/16" Root opening – Welding speed 2.7 IPM.

VERTICAL UP – 1/2" plate – Single V butt weld – 60° Included angle – Zero root opening – Pass =1, Stringer bead at 7 IPM – Pass =2, Full weave at 3.9 IPM – Pass =3, Full weave at 2 IPM.

FLAT – 1/2" plate – Single V butt weld – 60° Included angle – Zero root opening – Pass =1, Stringer bead at 9.6 IPM – Pass =2, Full weave at 4.1 IPM – Pass =3, Full weave at 2.1 IPM.

Weld mild steel *with* Airco's new Dip Transfer* CO_2 Welding

Do you want to save a large amount of money on mild steel, all-position manual welds? Switch to Air Reduction's new Dip Transfer CO_2 Process**—using the new fine-wire, AIRCOMATIC® PULL GUN, *Pureco*® CO_2 shielding, and Aircomatic Fillerarc® power supply.

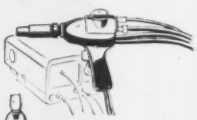
Typical results with this process are shown above. Spatter level is exceptionally low – because the system, by design, does the job with low amperage DC power.

Investigate . . . The new Airco Transfer CO_2 Process . . . Penny for penny, foot for foot, it is your most economical way to accomplish either single or multi-pass mild steel welding.

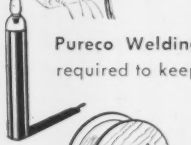
Write or phone Air Reduction for complete information.

*Trademark
**Patent Applied For

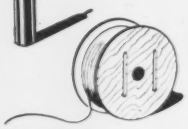
All you need for Dip Transfer CO_2 Welding are the following:



The new Aircomatic Pull Gun – with portable carriage assembly for wire reel and control equipment, plus cable, hoses and flexible wire casing.



Pureco Welding Grade CO_2 – at the purity and price required to keep this high production process economical.



Aircomatic wire. A675, produced in consumable fine wire form to Airco specifications.

Aircomatic Fillerarc power supply. Airco motor-generator type welder is designed for AIRCOMATIC characteristics—to produce the best weld.

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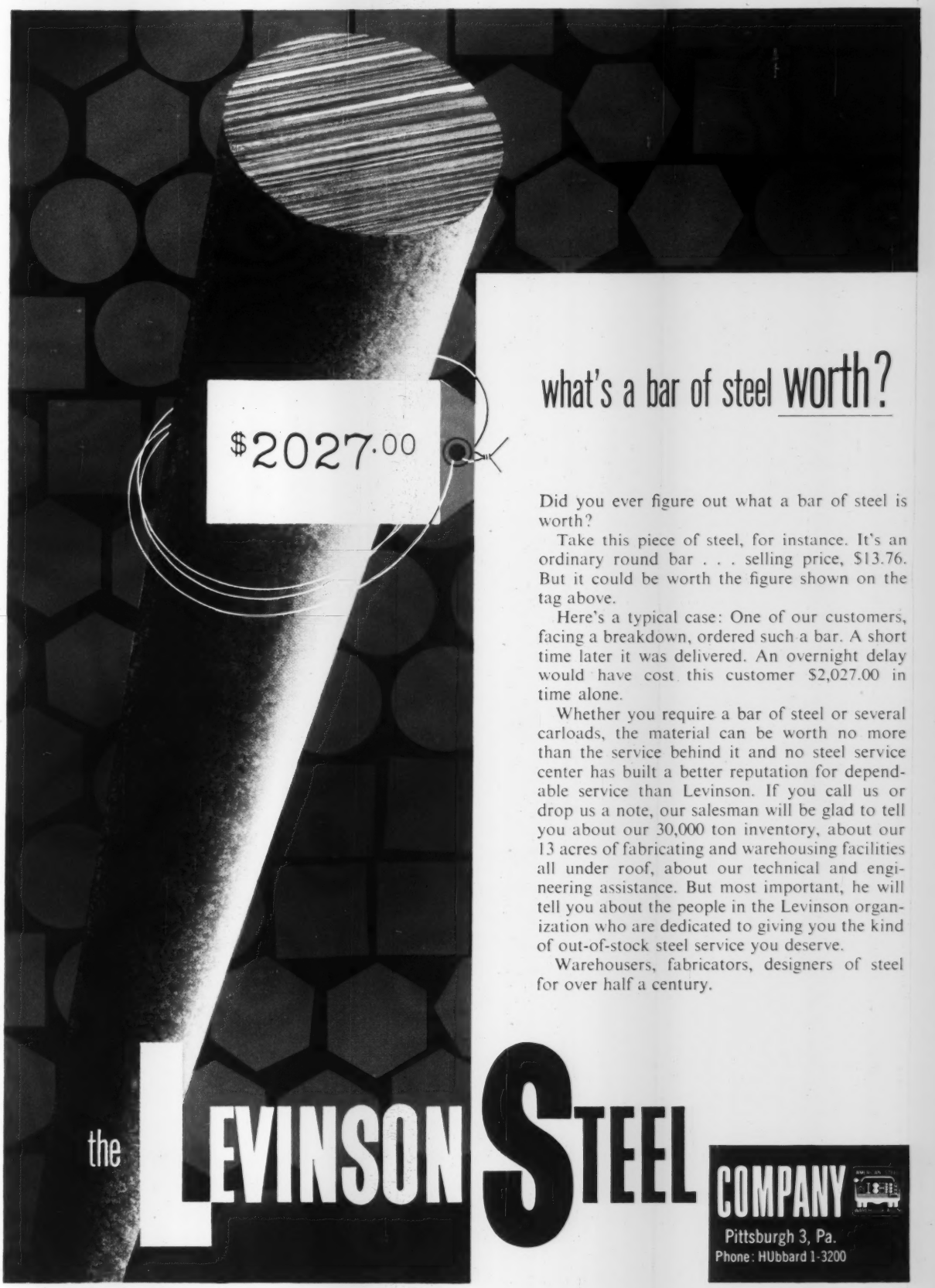

what's a bar of steel worth?

Did you ever figure out what a bar of steel is worth?

Take this piece of steel, for instance. It's an ordinary round bar . . . selling price, $13.76. But it could be worth the figure shown on the tag above.

Here's a typical case: One of our customers, facing a breakdown, ordered such a bar. A short time later it was delivered. An overnight delay would have cost this customer $2,027.00 in time alone.

Whether you require a bar of steel or several carloads, the material can be worth no more than the service behind it and no steel service center has built a better reputation for dependable service than Levinson. If you call us or drop us a note, our salesman will be glad to tell you about our 30,000 ton inventory, about our 13 acres of fabricating and warehousing facilities all under roof, about our technical and engineering assistance. But most important, he will tell you about the people in the Levinson organization who are dedicated to giving you the kind of out-of-stock steel service you deserve.

Warehousers, fabricators, designers of steel for over half a century.

the LEVINSON STEEL COMPANY

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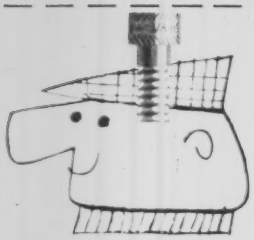


CAP SCREWS

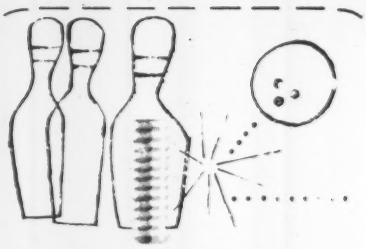
keep your cap on tight.

Owners of Thunderbirds, Corvettes and other snazzy top-down convertibles, tell us our special alloy and stainless steel P-K SOCKET HEAD CAP SCREWS do a mighty fine job of keeping their caps on. Naturally they specify PARKER-KALON, because they know P-Ks are instrument tested and inspected at every step of manufacture.

SHOULDER SCREWS

keep shoulders from sagging.

Used on either shoulder, or preferably both, P-K SHOULDER SCREWS will make you stand straighter, look better, may even result in getting you a substantial raise. Dependable, too. Heads are concentric with body for uniform, accurate assembly. Finished threads are close to shoulder for maximum holding power. And P-K SHOULDER SCREWS are accurate for positive internal wrenching and non-slip drive.



SET SCREWS

help make your score look good.

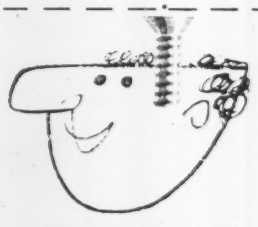
When the pin boy sets the pins for your opponent, he inserts a P-K SOCKET SET SCREW. Nobody'll know what's happening. Even a perfectly placed ball won't budge the pins as those P-K Set Screws hold them firmly to the floor. Same fine job in your plant, too. Use a P-K Cup Point for collars on pulleys and shafts. P-K Flat Point against hardened steel, and there's a selection of P-K Oval, Cone and Half-Dog Points from which to choose.

BUTTON HEADS

for you know who . . .

Take that neighbor who borrows your tools and never returns them. You can't openly call him names—his wife and yours are PTA buddies. So, just place a few Button Heads around his doorstep. He'll get the idea. And don't forget, you can also use P-K BUTTON HEAD CAP SCREWS for attaching cover plates and guards to production equipment and machine tools where countersinking isn't practical.

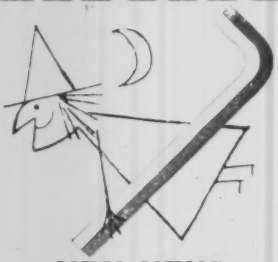
guide to P-K® SOCKET SCREWS



FLAT HEADS

for that well-groomed look.

Holes in the head are apt to cause talk. Especially where the top of the noggin tends to be flat and somewhat bald. Users can remove hats without embarrassment. P-K FLAT HEAD SOCKET CAP SCREWS are flush when countersunk, leaving smooth surfaces unmarred by burred slots. Use for fastening thin strips, moldings, plates and sheet metal where maximum head contact is required.



HEX KEYS

for putting a hex on people.

Persons planning the quiet disappearance of friends or neighbors, or merely interested in more productive shop practices, should always remember to specify P-K ENGINEERED HEX KEYS. They're heat treated under laboratory supervision to assure maximum resistance to torque stresses and freedom from brittleness. And come in handy for tightening those mighty fine socket screws offered by Parker-Kalon.

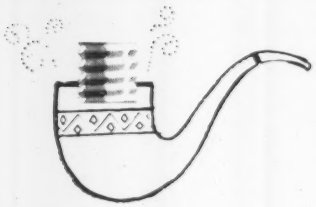
Like a copy of this guide for your office? We'll be glad to send a reprint suitable for framing.

PARKER-KALON®
SOCKET SCREWS

Sold only through industrial supply distributors

PARKER-KALON DIVISION, General American Transportation Corporation, Clifton, N. J.

Originators of the Self-tapping Screw; Manufacturers of Screw Nails, Masonry Nails, Wing Nuts, Thumb Screws and the new Rimguard Weld Screws.



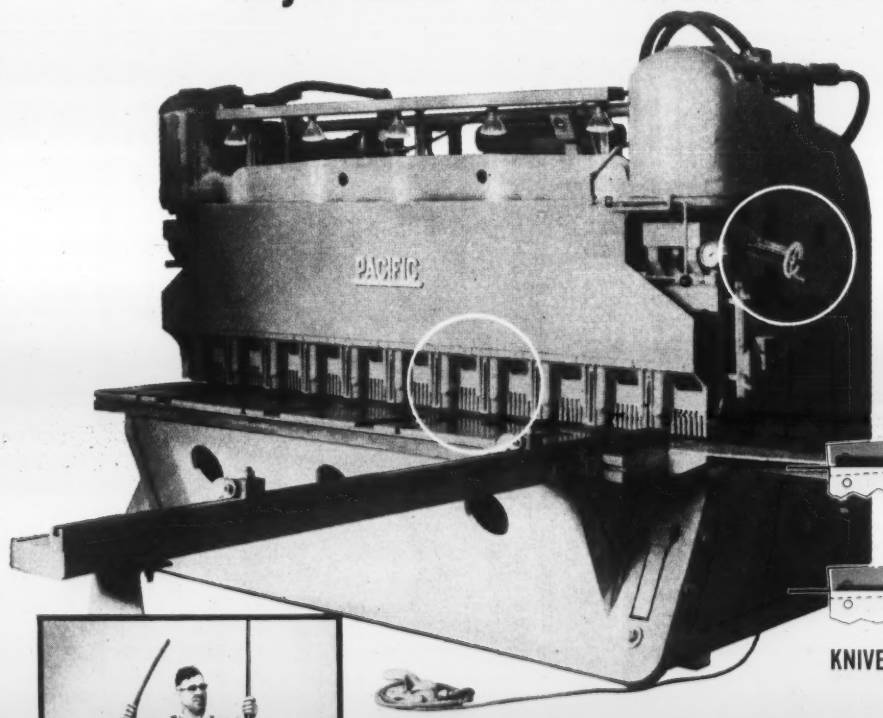
PIPE PLUGS

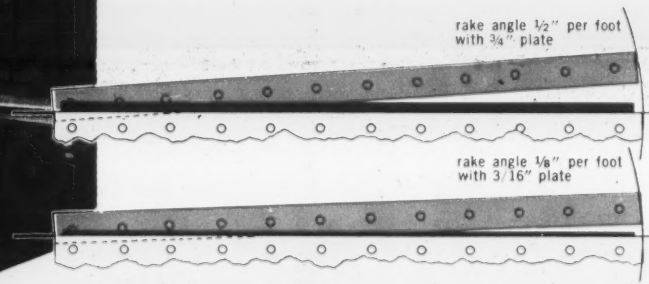
. . . just dandy for that old pipe.

P-K SOCKET PIPE PLUGS are the perfect answer whenever smoke gets kinda thick in the house and the little woman starts to get that look on her face. Drive one firmly into the bowl of your favorite pipe. No smoke escapes and all is peaceful. Examine a P-K Pipe Plug. Controlled chamfer makes for fast starting of threads. And P-Ks *Dryseal* produces a positive sealing without the necessity of a compound.

Adjustable rake PACIFIC HYDRAULIC SHEAR...

the single shear that produces highest quality cuts on both light and heavy metals.





Rake angle adjustable to match plate thickness

KNIVES STAY SHARP UP TO A YEAR OR MORE OF CUTTING 8 HOURS A DAY

Cuts up to 60 strokes per minute with minimum twist, bow and camber.

Left, ¼" plate cut with maximum rake angle. Right, ¼" plate cut with minimum rake angle.

Adjustable rake Pacific does the work of 2 or 3 conventional shears. It saves capital investment, valuable floor area and costs less to install. Heavy duty Pacific pays for itself out of operational savings . . . it takes fewer hands to operate, makes better cuts, requires little or no maintenance, virtually eliminates production downtime.

A Pacific shear for your heaviest cutting eliminates the wasteful expense of slow, costly burning. Powered hydraulically, Pacific cuts with a shockless, cushioned stroke . . . knives stay sharp longer saving cost of regrinding or replacement. Recurring costly downtime for turning or changing knives monthly is practically eliminated. Pacific is "quiet as a sewing machine" . . . it encourages greater efficiency from workers in plant or office.

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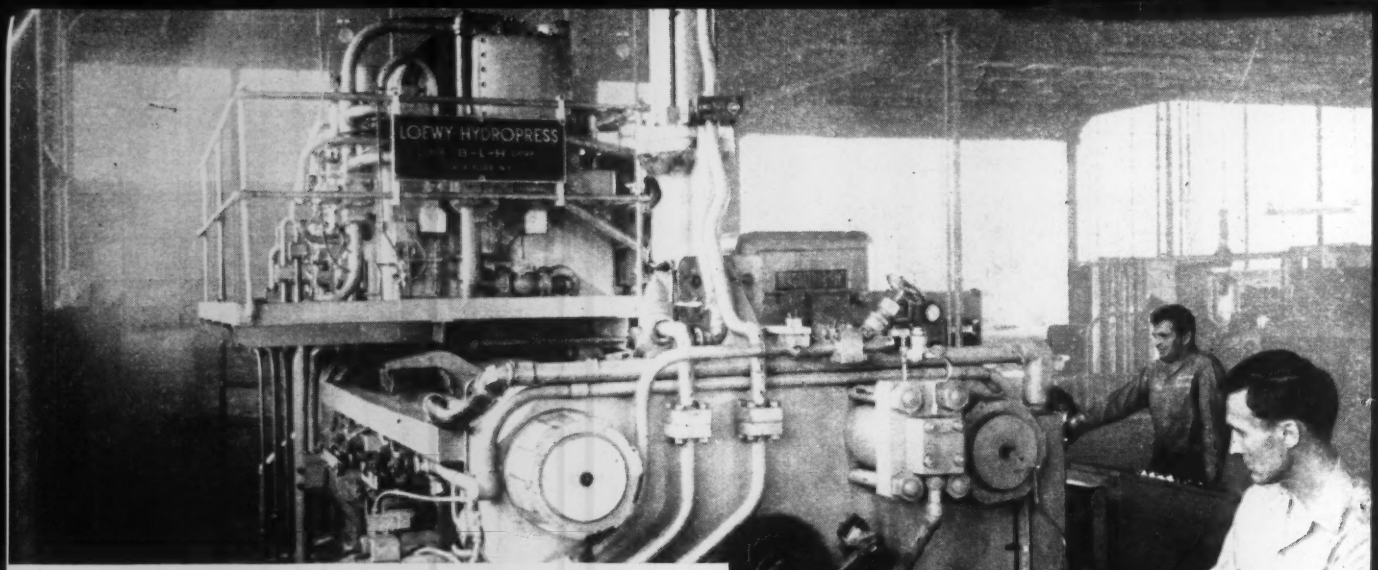

(above) At Alan-Scott Aluminum Corp., Division of Seasonmaster, Inc., Westbury, N.Y.

LOEWY 1250-TON-CAPACITY OIL-HYDRAULIC SELF-CONTAINED EXTRUSION PRESSES IN OPERATION

(left) At Arvin Industries, Inc., Columbus, Ind.

Loewy offers not only the finest extrusion presses, but also expert counsel on production planning

No longer is it enough for a pressbuilder to produce machinery which performs at high speed and with great precision and economy. His close contact with the individual business problems of many enterprises places him in the seat of a counselor, where his familiarity with the needs of industry and its problems of obsolescence, changes in trends and markets, new opportunities or local conditions, can be extremely valuable. Certainly in the ever-growing and complex field of extrusion his judgment can be of great value.

There is hardly any new development in our fast-moving technology which does not depend on the almost unlimited possibilities of extrusion. This is particularly true in the nuclear industry and the field of rockets and missiles. The application of extrusion widens every day. According to a recent report, school architects alone specified 75 aluminum extrusion applications. And a recent exhibit singled out 50 different fields in which extruded metals are being utilized.

Baldwin-Lima-Hamilton's Loewy-Hydropress Division, which pioneered extrusion in America, keeps a sharp eye on all developments in the markets for extrusion. And when you buy your extrusion equipment from us, we tackle not only problems relating to equipment design, but also those relating to production economy. This extra assistance goes with your order as an integral part of our service.

You may also be interested to learn that special attention will be given to your inquiries on the design, construction and implementation of complete plants ready to operate, including the selection of the site and production planning, or what are known as turn-key projects. For complete information on our facilities to serve you, write to Dept. B-11.

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Metalworking Outlook

Partmakers Try To Break Labor Patterns

Auto part suppliers are having only moderate success in breaking away from the pattern set by labor pacts with the Big Three auto companies. Dana Corp., employing 5500 at eight plants in Toledo, Ohio, and elsewhere got a penny break on wages and an agreement to restudy work standards. But another big partmaker, Eaton Mfg. Co., was unsuccessful in its attempt to negotiate a return to separate bargaining at local plants. Only a few have won major concessions, but they have usually had strong arguments in the form of losses or thin profits. Significance: You can break away from pattern settlements if you have compelling arguments and can back them up with a meaningful threat, such as a plant closing.

New Strikes May Hit Auto Assemblies

Now that strikes by auto production workers have about been cleaned up, walkouts from different quarters peril the industry's November and December assembly schedules. Several auto supplier strikes are now going on, and Chrysler Corp.'s whitecollar people started picketing last week. The suppliers' disturbances haven't hurt assemblies too badly, but they will if continued. Chrysler's troubles resulted in curtailed production last week. The industry's assembly goal: 590,000 cars in November, 600,000 in December.

Profits Rising

Are you experiencing a profit upturn? You should be. Income reports studied by the First National City Bank of New York show net earnings after taxes increased more than one-sixth between the second and third quarters. Significance: More often than not, in recent years profits have declined during the third quarter. Better sales and improved efficiency are bringing better profit margins.

Employment Act Revision Possible

Keep an eye on the House Joint Economic Committee hearings on the relation of prices to economic stability and growth. They start Dec. 15. The issue: Whether stable prices should be included as a federal goal. Many economists favor the idea if "full employment" as described in the act is modified to read "reasonably full."

Farm Machines Lead Upturn

Farm equipment is leading the recovery among all mass production industries. So believes the National Tool & Die Manufacturers Association, judging from orders to its members. Tool and die manufacturing, a barometer industry and the first to have felt the 1957-58 recession, shows "positive signs" of climbing out of the slump. "Average" activity is reported in ap-

Technical Outlook—Page 107 Market Outlook—Page 151

pliances, automotive accessories, electronics, aircraft, missile development, and business machines. The upward trend reflects improved outlooks in Cincinnati, Cleveland, southern Connecticut, Indianapolis, Los Angeles, Milwaukee, Nashville, Tenn., the New York City area, Providence, R. I., and New Jersey. Reporting less improvement were Chicago, Detroit, and Ft. Wayne, Ind., although an upward trend was noted.

Recovery Is Rapid

By the end of this year, the nation's industrial machine will have recovered all that it lost during the recession, believes Karl O. Nygaard, director of business research for B. F. Goodrich Co. "We can expect to go into 1959 with our gross national product at the annual rate of about $450 billion, a full $25 billion above the recession low and actually topping the previous high in the third quarter of 1957 by $5 billion."

British Steel Plans Expansion

Although British steel producers are only operating at 75 per cent of capacity, they're going ahead with expansion plans. New steel strip mills are to be built in both Scotland and Wales in accordance with the government's industrial expansion plan for the next five years. Production for the year won't surpass 22 million net tons.

Trucktrailers To Be Exchanged

A system of interchanging trucktrailers just approved by the Interstate Commerce Commission promises big benefits for you shippers. The new program will let truckers exchange trailers as railroads lend each other freight cars. You'll benefit through faster service and less damage in rehandling. Look for the plan to begin operating sometime next spring.

How To Handle Charity Drives

Here's a way to handle charitable fund raising drives. Employees at Chicago Screw Co., Chicago, work an extra day to contribute to their local community chests. The firm established its annual "Extra Workday" seven years ago. Employees come in on a designated Saturday and pledge a percentage of that day's pay to the fund of their choice. This year, over 60 per cent of the workers pledged half or more of their extra pay at time-and-a-half rates. The idea was conceived by the local union's president and endorsed by management. More than $85,000 has been contributed in seven years.

Straws in the Wind

Some 58 per cent of 908 companies surveyed by Vision Inc. will not give Christmas gifts this year . . . August Thyssen-Huette A.G., Duisburg, Germany, has taken a $155 million order for rolled steel from the Argentine government; delivery will be completed by March, 1960 . . . General Electric Co. offered election day off with full pay to all 650 of its Chicago employees if they worked for their party; 47 took the offer.

ANOTHER RYERSON PLUS: Production-ready steel

"There's the front end of our production line . . . right on time"

Steel right off the truck—ready for your production line . . . your steel supply can be that simple when you rely on Ryerson. You order only the kind and quantity of steel you need—*as you need it*—and cut costs all along the line.

You reduce investment in equipment as well as materials. You save valuable storage space . . . reduce handling costs, scrap loss, taxes, etc. You gain complete flexibility of steel supply without long-term commitments . . . and assure a ready, steady flow of material to keep production stepping. You're never caught short . . . you're never overloaded.

Ryerson's size, facilities, staff and service *attitude* assure dependable delivery to meet regular schedules or to handle special short-run orders. Whatever you need, this unsurpassed source of Certified Quality steel is at your finger tips. Phone your nearby Ryerson plant today.

RYERSON CERTIFIED QUALITY

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Member of the INLAND Steel Family

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HOW DSC-PORTSMOUTH Long Production Run LPR COILS Save Money for Bright Wire Users

TYPICAL CUSTOMER REPORTS

- Cut labor costs 15% by switching from 600 lb. to 1800 to 2000 lb. LPR coils for 75% of total bright wire requirements.

- Reduced scrap loss 90% by substituting 1 - 3000 lb. LPR coil for every 10 - 300 lb. coils previously purchased.

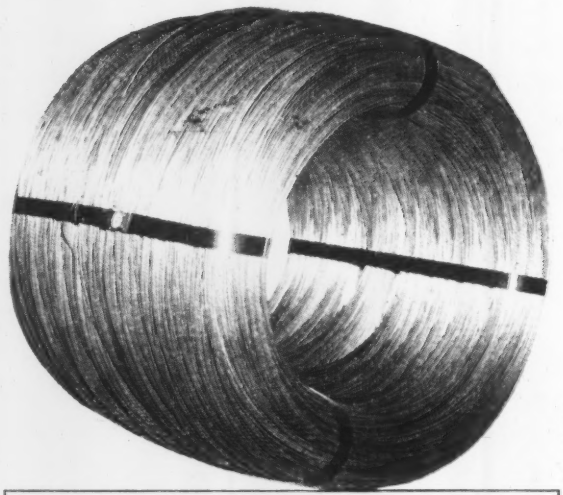
- With 1800 lb. LPR coils, one man now operates four straightening and cutting machines. Best previous experience with 600 lb. coils: one man, three machines.

FEWER PRODUCTION LULLS WITH LPR COILS — Every time you stop a machine to feed a fresh coil, you create a production vacuum. Vacuums cost money. The fewer coils you can use for a given job-weight of wire, the Longer Production Runs you get per set-up, and the less coil remnant scrap you generate.

SAVE HANDLING AND STORAGE COSTS, TOO — A user reported 16% saving in unloading time; others, reduction in storage space requirements and greater efficiency in checking and controlling inventory.

YOU CAN FORGET ABOUT "RETURNABLES," TOO — LPR coils stand up by themselves: won't kink, tangle or topple: need no special carriers in transit or storage. Free you of "returnables" problem: the bother of extra bookkeeping, inbound and outbound freight costs on "loaners," and the nuisance and responsibility of caring for vendor property.

The sign tells the story. See how DSC LPR COILS stack.



DSC LPR COILS are available in weights from 1000 lb. to about 4000 lb. each, in most popular gauges and carbon ranges.

LPR'S ARE "MUSIC" TO YOUR COST SHEETS — They increase your wireworking efficiency; step-up your output per man-or-machine hour; reduce your overall or unit manufacturing costs; improve your profits.

PRACTICAL POINTERS ON WIRE HANDLING — Yours for the asking—at your plant or at our Portsmouth mill. For quick action on LPR coils or on other DSC Products and Services, just drop a line to our General Sales Office at Detroit or call your nearest DSC Customer "Rep" . . . soon?

Customer Satisfaction Is Our Business

35TH ANNIVERSARY YEAR DSC

DETROIT STEEL CORPORATION

GENERAL SALES OFFICE, DETROIT 9, MICHIGAN

CUSTOMER "REP" OFFICES:

Charlotte, N. C., Chicago, Cincinnati, Cleveland, Columbus, Ohio., Dayton, Ohio., Detroit, Grand Rapids, Mich., Hamden (New Haven), Conn., Indianapolis, Jackson, Mich., Louisville, Ky., Milwaukee, Wis., New York, St. Louis, Toledo, Worcester, Mass., Winneconne, Wis.

The PROOF of DSC STEEL is in its PERFORMANCE on Your Job

DSC PRODUCTS: Coke . . . Coal Chemicals . . . Pig Iron . . . Basic Open Hearth Steel Ingots, Blooms, Slabs, Billets, Rods . . . HR and CR Sheet and Strip . . . Flat CR Spring Steel . . . Manufacturers' and H.C. Specialty Wire . . . Welded Wire Fabric

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Reciprocity Can Be Good

In the Sept. 1 issue of STEEL we raised this question: Is reciprocity good or bad?

Most of the readers who commented agreed with us: Selling and buying must be on the bases of quality, service, and fair prices to be compatible with the free enterprise system.

The director of purchases of a large metalworking company with sales of about $250 million a year disagrees. We think he should be heard:

"Your conclusions are inaccurate, out of date, and not in accordance with the current selling practices of most corporations, both large and small.

"Most steel companies, railroads, and oil companies have separate 'trade relations' departments that handle this problem in an orderly, straightforward way.

"The rules are simple and natural. All things being equal (quality, price, delivery), the customer is favored over the noncustomer.

"Most trade relations departments keep track of 'sales to' and 'purchases from' their customers and suppliers but do not have the authority to overrule the buyer's decision as to who gets the order.

"Rather than undermining the morale and effectiveness of a purchasing organization, I believe (this approach) is a morale builder. Every buyer knows that without sales, he won't have anything to buy, and the profits of the company, which influence his earnings, will be adversely affected.

"Sales people, properly trained, never lead with the 'reciprocity' approach. In fact, it is only brought out when conditions warrant it and never as a threat.

"There is nothing wrong or unethical with reciprocity in buying or selling when properly conducted.

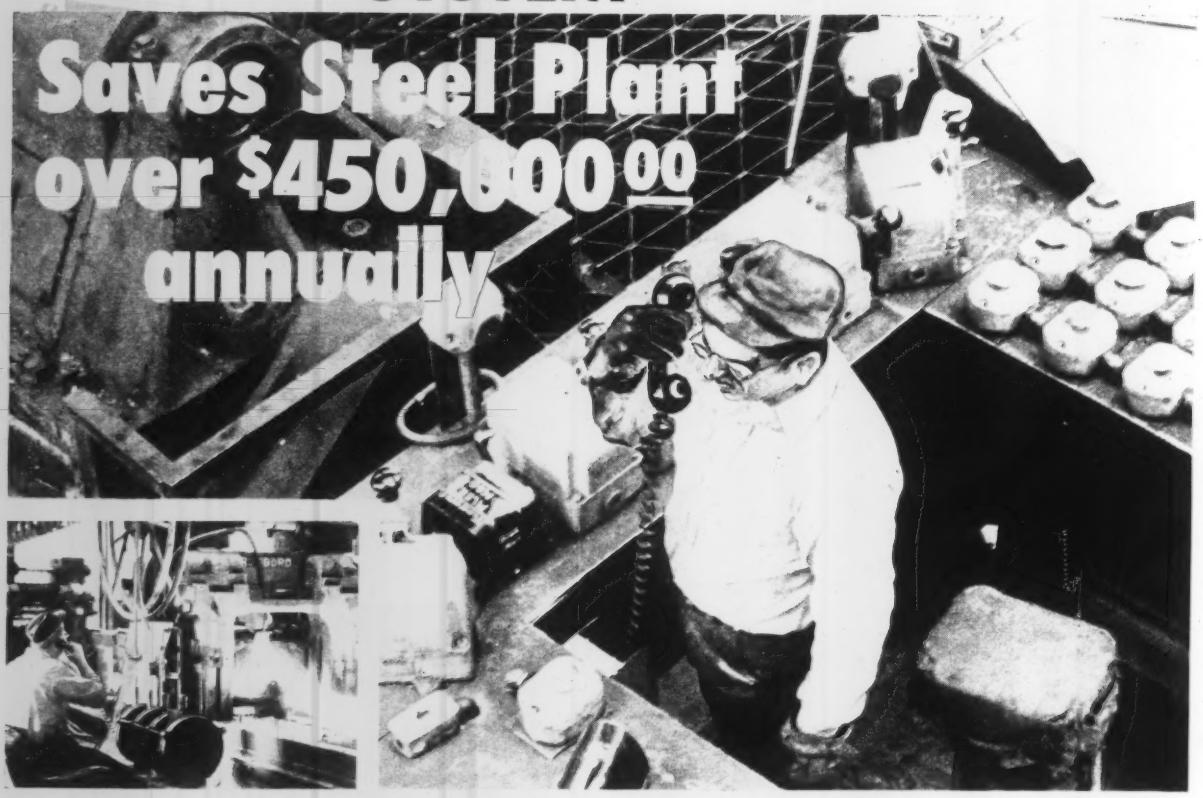
"Those companies that face the problem with facts and an intelligent approach, outline a policy and stick to it in all stages of the business climate."

We think we can maintain our original position and still recognize that there are many degrees of reciprocity. Of course, we have to be practical. There is nothing wrong with reciprocity if it is applied sensibly in normal trade relations.

Irwin H. Such

EDITOR-IN-CHIEF

NEILL *Engineered* COMMUNICATING SYSTEM*



NORTHWESTERN STEEL & WIRE CO. STERLING, ILLINOIS

ENGINEERED NEILL LOUD SPEAKER COMMUNICATING SYSTEMS are proving in installation after installation to be cost-cutting, efficiency-raising production tools. They pay for themselves in weeks in man hour reductions, elimination of mill returns and in accident prevention.

- The figure shown above is a conservative estimate. Actually, these savings will prove much greater over a period of time.
- It may pay you to talk with one of our engineers—without obligation of course.
- We'll be pleased to survey your operations to determine if similar savings can be effected for you.

*Not to be confused with ordinary paging systems.

Phone or write us for an appointment.

Cuts costs in these ways . . .

- Eliminates mill returns.
- Provides better quality control.
- Saves production down time.
- Cuts man hours.
- Provides superintendent with complete supervision of production line.
- Reduces set-up time.
- Increases out-put efficiency.
- Increases accident prevention.

R. W. NEILL COMPANY, INC.

4330 West Montrose Avenue • Chicago 41, Illinois

telephone: SPring 7-6200

New Congress: Regional Strength Can Govern Legislative Trends

	SENATE D	SENATE R	HOUSE D	HOUSE R
Metalworking's Heartland (Mich., Ohio, Ind., Ill., Wis.)	7	3	42	45
The Industrial East (N. Y., Pa., N. J., Mass., Conn., R. I.)	6	6	56	53
Upper New England (Vt., N. H., Maine)	1	5	3	3
The Central Seaboard (Del., Md., Va.)	3	3	16	2
The Border States (W. Va., Ky., Tenn., Mo.)	6	2	29	5
The South (N. C., S. C., Ga., Fla., Ala., Miss., La., Ark.)	16	0	63	2
The Southwest (Tex., Okla., N. Mex., Ariz.)	7	1	29	3
The Farm Belt (Kans., Nebr., Iowa, Minn., N. Dak., S. Dak.)	2	10	15	16
The Mining States (Colo., Utah, Nev., Idaho, Mont., Wyo.)	9	3	8	4
The West Coast (Calif., Oreg., Wash.)	5	1	20	21

What Will the Democrats Do?

Don't expect the new Congress to pass much legislation favorable to industry. Look for attention to housing, airports, water resources, atomic energy, missiles

CONTROL of Congress for another two years gives the Democratic party an opportunity to make some of its fondest dreams come true. Legislation which ran into a Presidential veto last session will be easier to bring home because of reduced Republican opposition.

• **Area Tally**—Where sectional interests are involved in legislation, you can expect congressmen from different areas to trade votes to insure passage of pet projects. The coalition between southern Democrats and conservative Republicans, which worked against northern liberals in the past, has been weakened. (See table above.)

Democrats will devote attention to:

• **Housing**—The effort to boost government loan support of the housing industry by $1 billion (STEEL, Nov. 3, p. 42) will be a lead item. Urban renewal, under heavy attack by private pressure groups this year, should see some new life blown into it.

• **Airports**—Few Washington observers are willing to predict that another Eisenhower veto of an expanded airport program will stick. They expect it to be overruled.

• **Depressed Areas**—Relocation aid

Postelection Poll

A meeting of industry representatives in Washington disclosed two poles of opinion on the election results.

It's a terrible thing:

"With the fair dealers in power, industry faces a tough future."

"The demagoguery of the Democrats will make your hair stand on end. The antifree enterprise boys have been given a mandate to speak."

"Further inflation is guaranteed. The auto industry, in particular, will be persecuted."

"Ohio, Illinois, and Indiana now see that it can happen to them as well as to Michigan. The cancer of union control of local politics will spread."

Yes, but we can salvage something:

"I have no intention of shooting myself. Industry cannot make judgments at this point. It must assume the new Congress will be made up of responsible, intelligent men, who have no desire to do us harm."

"The election means one thing: The Republicans must avoid right-to-work bandwagons."

"Don't get jittery. There are limits on what they can do to us. The bad financial situation may hold down the spenders."

"We stand a good chance of removing excise taxes on autos next session. Reuther wants it that way."

"Federal contributions to construction will increase."

to workers out of jobs because of technological changes and loans to communities and plants trying to keep up with the new age seem certain of passage.

• **Water Resources** — Increased spending for the salt water program, irrigation, and public dams is presaged by Democratic gains in the West.

• **Atomic Energy** — With more over-all Congressional strength behind it, look for the Joint Atomic Energy Committee to hold a series of hearings on our atomic programs. Object: To spur Congress into making big increases in the program's scope, as well as in the dollars to be spent by the federal government.

• **Space and Missiles**—Quite a few Democratic leaders are voicing fears that the National Aeronautical & Space Agency is not moving fast enough to catch up with the Russians. Senate Majority Leader Lyndon Johnson's famous phrase, "a sense of urgency," will again be heard, and additional funds will be given to the agency (whether conservatives like Deputy Director Hugh Dryden want them or not). A searching look at missile development has already been promised by the House Appropriations Committee.

About the only thing that can curb increased spending on these programs, guesses one Capitol Hill observer, is the tendency for a party with a large majority to become a little conservative. With increased tax revenues next year as the economy returns to 1956-57 levels, there will be some clamor for tax cuts on personal incomes. As insurance for another Democratic victory in 1960, Senator Johnson may feel that a little caution in 1959 may not be a bad thing.

But if we get an $80 billion budget from the administration for fiscal 1960, observers say it's even money that the Democrats will add $5 billion to it.

• **The Intangibles** — Increased spending will aid industry, but the Democrats will be cool on depreciation, renegotiation, and tax reforms.

Last session's lineup on the House Ways & Means Committee (where all tax legislation must originate and where depreciation and renegotiation reform are considered) was 15 Democrats and ten Republicans. Three Democratic and four Republican vacancies must be filled for the new Congress, if the same party ratio is maintained. At least one and probably several of the replacements will be more liberal than their predecessors. Antoni Sadlak (R., Conn.), sponsor of lower corporate tax legislation, lost out in the Democratic sweep.

On the Senate Finance Committee, the counterpart of Ways & Means, you'll see four new Republican faces, assuming last session's 8 to 7 ratio is maintained. (It will more likely run 9 to 6.) Such conservative Republicans as Edward Martin (Pa.), Ralph Flanders (Vt.), George Malone (Nev.), and William Jenner (Ind.) are not returning.

• **Crux**—If industry can pull favorable legislation out of committees such as those, chances are that the new liberals will kill it on the floor. Most committee members probably won't be willing to fight hard. (Watch Nov. 24 issue for STEEL's detailed analysis on possibilities for renegotiation reform.)

Alert Sounded at AMA as Russia Pushes Trade War

THE TIME has come for U. S. industry to recognize Russia as a serious competitor, warns Henry Kearns, assistant secretary of commerce. He and other speakers at an American Management Association meeting gave their appraisals of Soviet trade strategies.

Mr. Kearns noted that Soviet gains pose no near term threat to U. S. productive superiority, but he pointed out that the Communists have one advantage over traders in the Free World: "They can forget about their domestic consumption. We produce primarily for our domestic market.

"So it is easily seen that this Russian flexibility and unconcern for any relationship between export and domestic consumption constitutes a real danger to the economy of the free world nations."

• **How To Fight**—Another speaker, C. Douglas Dillon, undersecretary of state for economic affairs, cited five weapons the U. S. can use in economic warfare: 1. Continued operation of the Development Loan Fund. 2. Stepped up operations of the Export-Import Bank. 3. Increased U. S. participation with other countries in technical programs. 4. U. S. leadership in lowering barriers to world trade. 5. Strengthening government and industry co-operation.

Mr. Dillon considers a large scale increase in U. S. trade with Russia unlikely because the Communists are not interested in buying our consumer goods and a market in the U. S. for traditional Soviet export goods is limited.

Rep. Thomas B. Curtis (R., Mo.) said he wants to reintroduce in the next Congress a bill calling for creation of a "U. S. Trading Corp." as an aid to U. S. industries faced with unfair competition.

• **Russian Expansion** — Stefan J. Rundt, an international business consultant and former member of the East-West Trade Committee in Vienna, asserted that Soviet economic growth is twice as fast as ours. Since 1940, the number of people under the Communist influence has swelled from 171 million to about 945 million.

He added that by 1973, gross national product in Russia will have jumped to about $475 billion (it's about $175 billion now). The USSR is already the world's sixth largest trader; she was eleventh only eight years ago. Last year, Soviet trade climbed 15 per cent to about $8 billion. Even more significant is the fact that trade with countries outside the Russo-Sino sphere jumped to some $2.2 billion, about a 24 per cent increase.

• **What They Seek** — The total amount of trade carried on from Russia and China is small but selective.

At present, the Communists are shopping here and in Europe for chemical producing equipment, machine tools, mining gear, and textile machinery. Mr. Rundt pointed out that the Department of Commerce recently approved licenses for the export of about 35,000 tons of sheet metal to Russia (for automotive use).

China is in the market for tractors, trucks, food processing machinery, antibiotics, excavating and construction machinery, steel sheets, rods, wire, and heavy electrical apparatus.

• **The Dangers** — Mr. Rundt reminded the AMA that the Communists have already "gravely upset" the tin market and aluminum and platinum prices.

What they did to tin, they can also do to manganese, petroleum, tungsten, lead, zinc, and many other materials, he asserted. Relatively small quantities of these items could seriously harm the economics of scores of noncommunist nations. He also pointed out that patents would not be protected once the Communists got their hands on equipment.

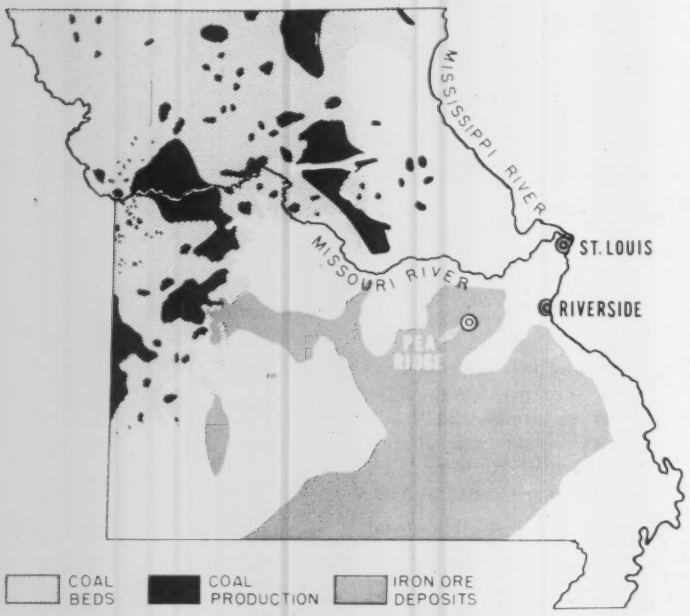
But Mr. Rundt also emphasized the peaceful aspects of trade with the Soviets. For the most part, he said, they pay their bills promptly and in full.

Mr. Rundt also stressed the importance of government backing for businessmen willing to do business with the Soviet Union.

• **The Steel Picture**—D. N. Vedensky, director of research and development, M. A. Hanna Co., Cleveland (and a member of the group that visited Russian steel centers this year), said he expected steel to remain scarce in Russia for some time. Reason: Its projected industrial expansion will require increasing amounts of steel. It will be at least ten years before Russia becomes an important factor in European steel trade, thinks Mr. Vedensky.

ENGINE MOUNTING BRACKETS in this Convair F-106A Delta Dart interceptor are forged from A-286, a special alloy made by Allegheny Ludlum Steel Corp. Because the alloy is highly resistant to heat and corrosion, has great strength at high temperatures, only three of the "dog-leg" brackets are needed to secure a J-75 jet engine with a thrust of 15,000 lb. Similar brackets (inset) hold the smaller J-57 engine, with 10,000-lb thrust, in the Convair F-102A interceptor

Can Missouri Lure a Steel Plant?



Source: Missouri Division of Resources & Development

Missouri Woos Metalmen

The state plans to use its rich iron ore discovery to attract a steel plant, then sell metalworking on its location, raw materials, climate, and other resources

A HOLE in the ground at Pea Ridge (southwest of St. Louis) promises to open new horizons for Missouri. The treasure: An estimated 100 million tons of iron ore. The Missouri Division of Resources and Development reports its iron content is about 63 per cent.

Meramec Mining Co. (owned by Bethlehem Steel Corp. and St. Joseph Lead Co.) is spending $35 million to put the project into full production by 1962. The Missouri Pacific Railroad will run a 25-mile spur to the mining site at a cost of $3 million. A 200-car freight yard at the mine will handle an estimated 100 carloads of beneficated iron ore daily.

• **What It Means** — "Chances are good that a new steel plant will be built in Missouri as soon as a large continuous supply of ore is assured," believes E. L. Bilheimer, Meramec's general manager. Other sources are being explored. "At least seven large companies have lined up mineral rights for their own exploration," reports Richard Kinne, industrial director for the Resources & Development Division.

He believes Missouri offers an ideal site for a steel plant: About 20 miles south of St. Louis, on the Mississippi, near Riverside (see map). It's almost on a line between the geographic and population centers of the nation. It's close to coal and limestone deposits, and rivers offer natural distribution channels. (Coal shown on map doesn't lend itself to coking; it would come from bordering states.) The new railroad spur will link the Pea Ridge mine with the vast rail networks running out of St. Louis and Kansas City. Riverside will offer adequate rail facilities.

Missouri annually generates more than 100,000 net tons of prompt industrial iron and steel scrap. Surrounding states offer ample supplies. Electric power is adequate.

"Labor is plentiful," reports Mr. Kinne. "People are moving out of the state to get jobs. They would have to be trained, but the state government is willing to set up cooperative programs for that purpose. And managerial talent is available; 25 per cent of the top 1000 manufacturers in the country have native Missourians on their boards. Our colleges and universities are training men in all the necessary fields."

Mr. Kinne figures the area offers a big enough market to support a fully integrated mill. The transportation and heavy nonelectrical machinery industries would be the largest markets. Others: Electrical machinery and fabricated metal products.

• **Followthrough** — A steel plant would boost Missouri's chances of becoming a more important metalworking center. The state is promoting itself as a good place for metal fabricating plants to locate. While its birth rate about equals the national average, population growth has been much slower: A labor surplus has caused a northern migration. But retail sales have climbed 15 per cent in the last three years. The state's per capita tax burden is $63—fourth lowest in the nation.

The Resources & Development Division reports that 51 manufacturers (17 in metalworking) entered the state in 1958's first six months; 82 companies (26 in metalworking) expanded. Metalworking's capital expenditures were $17.5 million, vs. $29.9 million for all manufacturing firms in the state.

International Harvester Co.

Inland Waterway Traffic

(Exclusive of Great Lakes)

	Net Tons
1958	360,000,000*
1957	400,000,000*
1956	384,097,615
1955	362,555,910
1954	319,780,826
1950	297,694,832
1947	262,282,074

*Estimated.
Source: American Waterway Operators Inc.

Metalworking Barges Ahead

Lower freight costs and expansion of marketing areas spur dramatic growth in river traffic, say barge operators. They look for a new high in revenues next year

INLAND WATERWAYS carried more freight last year than ever before, despite a second half business recession. River traffic may dip about 10 per cent this year, but barge operators aren't discouraged. They're looking for record revenues in 1959.

"We're selling a lower over-all freight cost," a barge executive explains. "Our customers can save money on the raw materials they bring into their plants and on finished goods that they ship out. Most important, they can expand their markets to areas where absorption of rail or truck rates would be prohibitive."

From 1927 to 1946, traffic on the inland waterways (excluding the Great Lakes) rose from 9 billion to 28 billion ton-miles. In a spectacular postwar renaissance, it rocketed to last year's peak: 120 billion. The principal commodities hauled include petroleum, bituminous coal, sand and gravel, iron and steel, grain, and chemicals. Last year, steelmakers upped their barge shipments of mill products from 6.5 million to 7.3 million tons. About 9 per cent of their finished steel went by barge. In 1953, 5 per cent took the water route.

• **Down River Shipments**—Chicago, Youngstown, and Pittsburgh mills ship oil country goods down the Mississippi and Ohio Rivers to such destinations as Harvey, La., and Corpus Christi, Tex., and up the Missouri to Kansas City, Mo. They consign sheets, bars, structurals, tin plate, and wire to a list that includes Cincinnati, Louisville, St. Louis, Memphis, Tenn., Houston, and New Orleans.

Oil country goods are the largest tonnage item. They're shipped mainly to "transit yards" which the steelmakers set up last spring. When the oil companies announced that they weren't going to carry inventories, mills established down river stocks available for overnight delivery. Truckers unload the barges, operate the yards, and deliver the goods.

• **Swing to Barges**—"In the last eight years, we've raised the proportion of our finished steel shipments going by barge from 5 to 15 per cent," an eastern mill reports. "We've gone from 45 to 75 per cent in oil country goods (mainly because of changed marketing conditions). Our sales department thinks our best future markets lie in areas adjacent to the rivers, so we may become even more dependent on barges."

A Chicago mill that shipped 4.2 per cent of its finished steel by water last year is now barging 7.3 per cent. At Pittsburgh, the situation is static: One producer is shipping 5 per cent of its steel by barge, while another puts its shipments at 18.5 per cent. A midwestern steelmaker says: "From January, 1957, to November, 1957, we shipped 59.5 per cent of our oil country pipe by rail and 40.5 per cent by barge. In December, rail freight rates increased, and so did our barge shipments (to 48.2 per cent). When the transit stocks were set up early this year, barges got the lion's share (53.8 per cent)."

• **How Mills Save**—If a Pittsburgh

mill ships steel to Danbury, Tex., by barge and truck, its freight bill is $15.87 a ton ($9.87 for barging to Houston, $1 for unloading, and $5 for trucking from Houston to Danbury). The all-rail rate from Pittsburgh to Danbury is $25.20 a ton, so barge-truck routing saves $9.33. If it ships sheets to Cincinnati, it pays a $2.34 barge rate, 90 cents for unloading, and $1.20 for a local truck delivery. Total: $4.44 a ton. The all-rail rate from Pittsburgh to Cincinnati is $8.80, so barging saves $4.36 a ton.

A Chicago steelmaker figures its cost per hundredweight on shipments of sheets to New Orleans at 36 cents by barge (including a "typical charge for unloading and switching to the customer's plant"), 66 cents by rail, and $1.46 by truck. On shipments of tin plate to St. Paul, it figures these costs per hundredweight: 34 cents by barge, 44 cents by rail, and 69 cents by truck.

• **Mills Expand Markets** — If it weren't for barges, Pittsburgh mills couldn't compete with Chicago producers for business in New Orleans and other southern markets, says L. P. Struble Jr., president of Union Barge Line Corp., Pittsburgh. "The rail rates from Pittsburgh and Chicago to New Orleans are $24.20 and $13.20 a ton respectively," he points out, "resulting in a handicap for the Pittsburgh mill of $11 a ton. But barge rates are $7.34 and $5.83 respectively, reducing the differential to $1.51."

Adds George B. Schierberg, president, Granite City Steel Co., Granite City, Ill.: "Barge line transportation is important because it increases our ability to reach some markets competitively. It enables us, for example, to remain competitive with Chicago mills in the Minneapolis-St. Paul market."

• **Auto Carriers**—Of the fabricated products that are moved by barge, autos are most significant. About 250,000 cars go to market via the water routes every year. They're carried down the Mississippi to Memphis and Houston and to Gulf ports for export. Foreign autos come up the rivers for distribution in northern cities. Also shipped by barge are mining, construction, and agricultural machinery, rail car trucks, aircraft, furniture, and refrigerators. Relatively few household appliances go by water because a barge load (500 tons) is usually too much for a single market.

• **Disadvantages**—"If we can't save at least $1 a ton by using the barges, there's no use going to that method," says John Moore, assistant traffic manager of International Harvester Co., Chicago. Here are some of the drawbacks: 1. Natural limits of routes. 2. Slow deliveries. 3. Need to accumulate larger tonnages to take advantage of minimum rates. 4. Necessity of making larger investments in inventory. 5. Necessity for scheduling operations farther ahead. 6. Need for costly docking and unloading facilities at ports of call. 7. Closing of northern ports during the winter.

Occasionally, the slowness of barge transportation works to the shipper's advantage. Case in point: Last April, International Harvester shipped two bargeloads of hay balers from Memphis to St. Paul, a distance of about 1000 miles requiring 12 days. When loaded, the balers couldn't have been sold because the season hadn't begun. By the time they arrived, they could be transferred to trains and shipped directly to dealers rather than to storage.

• **Faster Service** — Locks are the limiting factor, so far as the speed of barge transportation is concerned. From Pittsburgh to New Orleans there are 46, and many are in poor condition. If reconstruction programs proceed on schedule, there will be 40 locks within a few years and 31 in 1970. As new dams are built, pool depths will increase and barging will become more efficient (heavier loads, longer tows, and better speeds). In recent years, barge operators have upped their average speed from 4 to 6 mph on round trips between Pittsburgh and New Orleans.

Labor Scores in Elections

Labor organizations won more collective bargaining elections (821 of 1243 held) during the third quarter than in any quarter of the last three years, says the National Labor Relations Board.

Other records set during the quarter include the filing of the largest number of charges of unfair labor practices, the most charges filed against employers, and the issuing of the greatest number of unfair labor practice complaints (156) in two years.

Peaceful H-Bombing Has Vast Potential

ABOUT 130 million cu ft of earth can be displaced today for $5 million—the cost of five atomic bombs. It would cost $60 million to excavate a harbor that size with conventional equipment.

One British thermal unit generated by an H-bomb can liberate three to 10 Btu from oil shale, adds Dr. John Grebe, director of Nuclear & Basic Research Laboratories, Dow Chemical Co. Cost: 4 cents per million Btu. Dr. Grebe says the world is literally floating on oil shale, so the millenium of power is just around the corner. Only our psychological block against using such bombs for peaceful purposes stands in the way.

• **Fears Dispelled** — The bombs wouldn't have to be large, an Atomic Energy Commission source notes. The harbor could be dug with four, 100-kiloton bombs (for the connecting channel) and a single, 1 megaton bomb (for the basin). "Minimal" radioactivity would be released, most of which would be carried into the ocean.

In an experiment in Nevada this year, a 1.7-kiloton bomb was buried about 250 ft below the surface of a hill. The effect was so slight that observers 2.5 miles away were arguing whether the bomb had gone off until dust clouds appeared.

• **Uses Listed**—"The time to act is now," says Dr. Grebe. Industrial applications could include ore mining, flood control, tapping dry river beds, and capturing vast underground stores of heat and energy created by explosions.

Sign of the times: Richfield Oil Corp. has requested the Canadian government to get a bomb from the U. S. to tap Canadian tar sands for oil.

Airless Plant Aids Space Conquest

SPACE-SUITED technicians at the IN-FAB (INert-FABrication) plant under construction at Universal-Cyclops Steel Corp., Bridgeville, Pa., will work in a unique environment to produce high temperature refractory and reactive metals for use in outer space.

A complete fabrication plant sealed within a building and filled with argon gas, the IN-FAB facility will process exotic metals for missile nose cones, rocket and jet engines of the future, and space vehicles.

• **Design Is Unique**—Such a plant creates construction difficulties unlike anything encountered before. The design must:

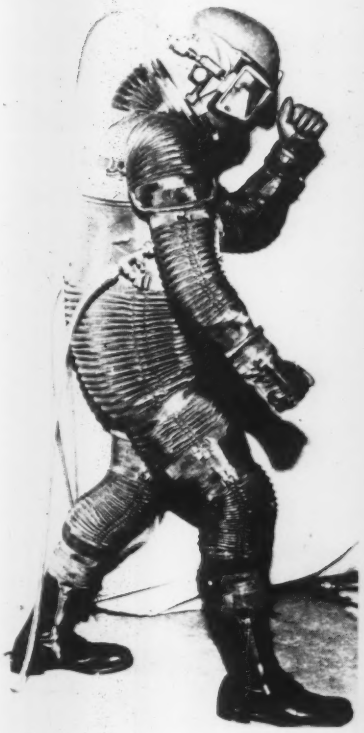
1. Provide optimum safety for technicians working in the oxygen-less atmosphere.
2. Keep the expensive argon gas from leaking out of the building.
3. Maintain atmospheric purity despite frequent opening and closing of the three personnel locks, an equipment lock, and a material lock.

• **Oxidation Eliminated**—Universal-Cyclops expects to work on such metals as columbium, tantalum, molybdenum, and tungsten which are highly reactive at the temperatures needed for fabrication (3000 to 5000° F). They will be processed in the argon atmosphere (99.995 per cent pure), then coated to prevent oxidation and nitridation.

Processing equipment inside the steel room (it's made of welded 3/16-in. sheets) will include a rolling mill, crane, and horizontal impactor. It will turn out bars, forgings, and sheet products.

• **Operators Kept Safe** — Although technicians will work in the room for only short intervals, the "space suits" will keep them safe. They help shield the men from infrared and ultraviolet radiations as well as providing them with oxygen.

Leakage of air from the suits could cause as much trouble as leakage of argon into them. Air entering the room would contaminate the atmosphere, causing damage to the metals in process. To prevent that, every three hours, the entire atmosphere of the room is removed, purified, and returned.



Technicians working in Universal-Cyclops IN-FAB plant will be garbed in protective clothing like this

In the argon purification system, oxygen is removed by chemical reaction with hydrogen. (The hydrogen and oxygen react to form water, which is removed by a dryer.) Then, low-temperature distillation (at minus 300° F) separates any residual hydrogen, nitrogen, hydrocarbons, or other gaseous impurities. The system is practically automatic and adjusts itself to changes in load.

• **Knowhow Built In** — The IN-FAB facility has been in the planning stage for more than two years (see STEEL, Oct. 22, 1956, p. 78). Completion is expected in 1959. Universal-Cyclops negotiated a $3 million contract with the Navy's Bureau of Aeronautics to build the plant.

Prime subcontractor is H. P. Foley Co., Pittsburgh. Engineering consultant is Tampa Bay Engineering Co., St. Petersburg, Fla. Subcontractor for the argon atmosphere equipment is Air Products Inc., Allentown, Pa. Engineering and design was done by Rust Engineering Co., Pittsburgh, which will provide architectural supervision.

Army Plans Moon Rocket

The Army is definitely planning a moon shot and the program is "on schedule," said Maj. Gen. John B. Medaris, commanding general, U. S. Army Ordnance Missile Command, in Cleveland last week. He wouldn't reveal the date.

"We have the facilities to beat the Russians," General Medaris said in talking about the race into space. "It's just a question of how much we want to spend and how hard we want to work. Rockets to other planets are within the realm of possibility. We know how to do it. It's a matter of technology."

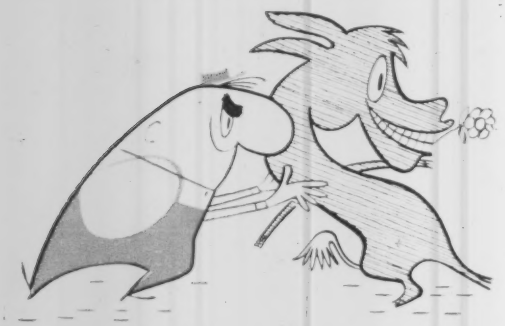
Queried on interservice competition, he commented: "In any society that puts a premium on achievement, rivalry is important to that achievement. It is a stimulus and a challenge to pride. On this premise, I think interservice rivalry is essential for achievement. It has helped our missile program."

West To Lead in Oxygen

The far western states will soon lead the nation in the use of oxygen for steelmaking, says W. M. Haile, president, Linde Co., division of Union Carbide Corp., New York.

Mr. Haile said in San Francisco that oxygen usage has increased 4 per cent a year in the West compared with 2.5 per cent for the rest of the country. He attributed the increase to the growth of the western area and the proximity of the missile industry.

Linde Co. expects the first unit of its $6 million plant near Pittsburg, Calif., to be in production by June 1. Full production of 300 tons daily of liquid oxygen and nitrogen will be reached in 1960.



Do the Unions Control Congress?

TWO WEEKS before the election, the *Machinist*, voice of the million-member International Association of Machinists, published photos of 15 Democratic candidates for the Senate who had been endorsed by local IAM councils. Only four failed to win.

Such results look alarming. You may well wonder if your more conservative representatives in the new Congress won't be outvoted by antibusiness, prounion men.

A look at the union's defeats is revealing: Two of the most important states, New York and Pennsylvania, didn't follow the IAM's recommendation. In Arizona, an antilabor senator won. Sen. John Williams, a moderate man by any yardstick, was re-elected in Delaware.

Senator Williams will continue to play an important role in shaping economic policies, through his ranking minority membership on the Finance Committee. Sen. Barry Goldwater (R., Ariz.) becomes the ranking minority member on Sen. John McClellan's (D., Ark.) Labor Investigation Committee.

Labor Is Feeling Its Oats

Democratic proposals for new legislation (see Page 57) and those voiced by labor are also revealing. Significantly, the two programs do not jibe 100 per cent.

Democrats, including some endorsed by labor, should not be expected to lead the country down the road to socialism in the next two years. Harry Truman was re-elected in 1948 on a platform to repeal the Taft-Hartley Act. Nothing happened.

Another factor: During the next two years, you can expect Senate Majority Leader Lyndon Johnson (D., Tex.) to play his moderate, conciliatory role to the hilt.

Rep. Sam Rayburn (D., Tex.), leader of the House, is in the same position. His whip hand will hold the left wingers of his party in check through committee assignments, argument, and the fear of incurring Mr. Sam's wrath.

Labor is feeling frisky now, and you certainly can expect some more liberal legislation out of the new Congress, but moderation will eventually win. The Southerners will see to it. Through chairmanships, they control every Senate committee except Appropriations, Foreign Relations, Interior, Commerce, and Public Works. Two of those are headed by Southwesterners. The rest are headed by senators from Rhode Island, Montana, and Washington. There's not a liberal, metropolitan minded Easterner in the bunch.

On the House side, Southerners head all committees but Foreign Affairs, Government Operations, Interior, Judiciary, and Public Works. Rep. Emanuel Celler (D., N. Y.), chief of the Judiciary Committee, is the only solid antibusiness figure there—on the basis of his stand for prenotification of mergers and antitrust legislation.

Kefauver Opens Attack on GM

One subcommittee in the Senate, that of Estes Kefauver (D., Tenn.), can be counted on to raise hell. The subcommittee's economist, John Blair, has just released his views of General Motors Corp.'s "monopolistic" control of the auto industry.

Minority Leader Everett Dirksen (R., Ill.) takes issue with the report, calling it a "half-truth." Senator Kefauver and the Democrats on the committee charge GM with setting prices for the whole industry, forcing its dealers to handle GM products exclusively, obtaining concessions from its suppliers not available to its competitors, spending too much on advertising, and changing auto styles too often. Most of those things, Senator Dirksen implies, are the auto industry's business, not the Senate's—at least in an economy supposedly dedicated to free enterprise.

The report, it should be noted, is an outgrowth of Senator Kefauver's concern with the growing "concentration" of industry, and has little to do with GM's testimony on inflation. In calling for a Justice Department investigation of the industry, the subcommittee is simply repeating itself. Justice has already decided to avoid this hassle.

GM Chairman Frederic G. Donner calls it "unfortunate that the subcommittee's original objective of coming to grips with inflation appears to have been sidetracked." He adds: "News accounts of the report convey the . . . impression that its principal emphasis is not on . . . inflation, but rather that it reflects speculative, conjectural, and partisan opinions on a variety of subjects concerning the automobile industry."

New Look for the Missile Program?

K. T. Keller, our first missile czar under President Truman, and Dr. Clifford Furnas, once the Pentagon's R&D chief, are consultants to the House Military Appropriations Subcommittee for its probe of missile spending (scheduled to start in January). Observers expect the subcommittee to find that we are spending too much on too many missile projects. Recommendations to stop conflicting and overlapping projects will probably come, in line with Dr. Furnas' charges that Pentagon research is obsolete. Since the committee controls the Pentagon's purse strings, its findings can be expected to become the new defense policy.

ECTRONIC ONTROL STEMS

LEADERS IN NUMERICAL CONTROL

S-C
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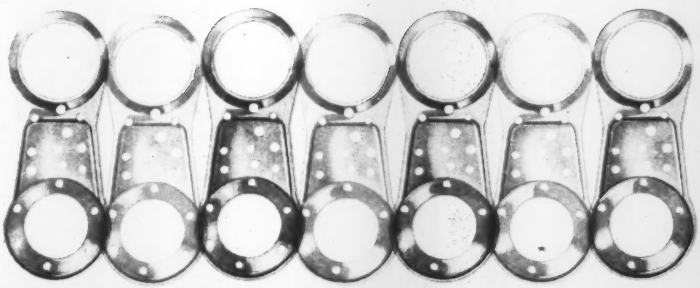

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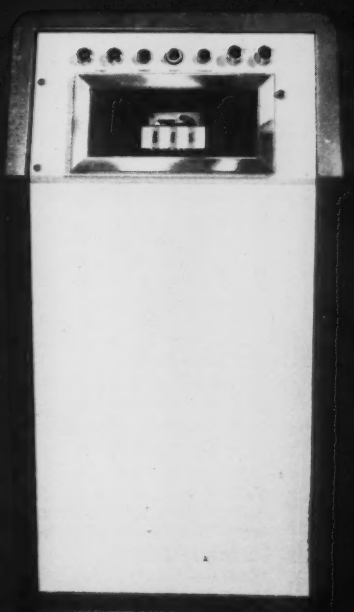

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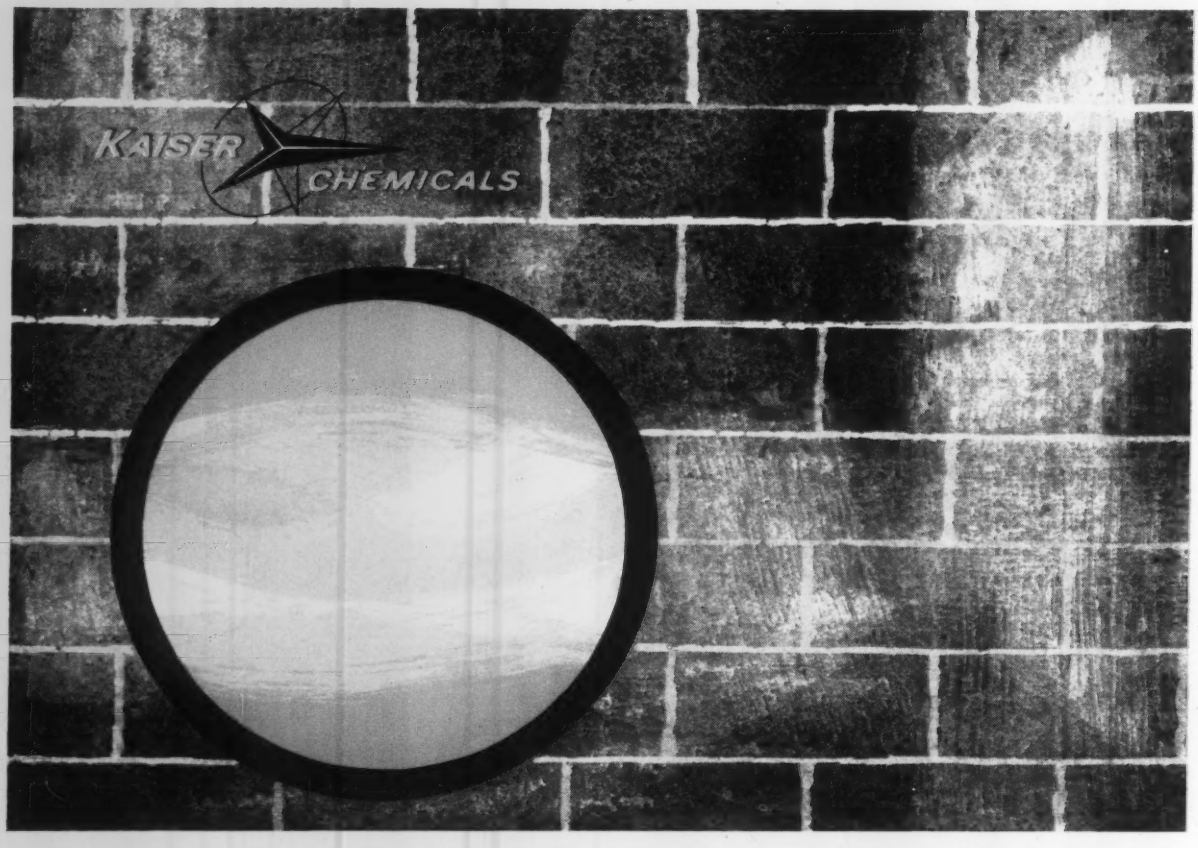

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How Worthington Runs Like Federation of Smaller Firms

THE 118-year-old Worthington Corp., Harrison, N. J., is streamlining itself with young ideas. Sales soared from $82,955,000 in 1950 to a record $191,527,439 last year.

That's the payoff from a program launched in 1949 that has encompassed expansion, diversification, and improvement in company organization and performance, and which has now been climaxed by the adoption of a modern trademark.

In entering such fields as liquid, gas, and air handling, power transmission and generation (to name a few), the old company name (Worthington Pump & Machinery Corp.) was shortened to reflect the diversity.

• **How It Works**—A divisionalization plan, underway since 1956, was designed to accommodate rapid growth. It allows the company to operate as a federation of smaller, separate firms. Sixteen general managers are virtually autonomous. Available from headquarters are special services which no division could support on a continuing basis.

"Responsibility and authority go hand in hand," says Walther H. Feldmann, Worthington's president. "We can't make people responsible for work and accountable for results without giving them the commensurate authority to do the job."

• **Performance Measured**—The general managers report to top management through a group vice president. (The president's staff is made up of all vice presidents, the comptroller, and treasurer.) Stewardship is measured against a performance standard mutually acceptable to the manager and management. Return on capital employed consistent with long range growth is a primary factor.

• **Many Benefits** — Worthington's reorganization combines a specialized company's speed and knowledge of customers, markets, and products with large company advantages in finance, diversification, and functional specialists. The new setup offers six major benefits:

Places decision making authority where the facts are available and the opportunity to move fast is improved.

Develops men within the corporation capable of succeeding to top positions.

Allows more time for executives to plan and organize.

Provides greater opportunity for standardization within the company.

Develops better teamwork between major divisions which speeds decisions.

Retains large company advantages in financial stability, resources and relationships, diversification, expert staff assistance and guidance, and customer service.

• **How It Was Done**—People involved in the reorganization were notified a year in advance to reduce the shock and provide plenty of time to eliminate problems. Principal among these was accounting for interdivisional transactions. Worthington found most employees were anxious to assume responsibility and authority.

General managers were needed. "In most cases our choice was quite clear. In all cases, no one suffered a setback," states Mr. Feldmann. For example, a works manager who was passed over, continued in his prior capacity as manager of manufacturing.

• **Results**—Mr. Feldmann concludes that while increased management costs have resulted, performance improvement more than compensates. Most important, the training for higher management responsibilities is building a solid foundation for a successful future.

Discussing Worthington Corp.'s old winged trademark and its replacement are (left to right): T. J. Kahane, vice president-marketing, H. C. Ramsey, board chairman and chief executive officer, and W. H. Feldmann, president

Research Tab: $6.5 Billion

American industry backed its search for scientific knowledge with a $6.5 billion research and development investment in 1956, reports the National Science Foundation, Washington. Comparison: $3.7 billion was spent in 1953.

About half the research was done by two metalworking industries. Aircraft and producers of associated parts spent $2.1 billion. Work on electronic systems and components cost $1.2 billion.

Applied research and development expenditures in electronics totaled $1.4 billion in 1956, the Electronic Industries Association, Washington, estimates.

About $1.1 billion of the work was done by three areas of metalworking—producers of electrical machinery, equipment, and supplies, spent $670 million. Producers of aircraft and associated parts, $261 million; producers of machinery, including computers, $182 million.

Key Cost Factors in Pension Plans

- Basic benefits—today's plans provide from $140 to over $200, a month, including social security, for employees retiring at 65 with 25 to 30 years of service.
- Age of retirement—decreasing minimum age from 65 to 60 can boost costs 50 per cent. Increasing age from 65 to 67 can cut costs 15 per cent.
- Vesting provisions can add 6 to 10 per cent to costs.
- Disability benefits can boost costs as much as 10 per cent.
- Death benefits mean extra costs.

Feeling the Pinch for Pensions?

Many metalworkers are. Here are things you should know about types of plans, costs, the trend, plus how to go about designing and establishing a tailored program

PRESSURE for pensions is mounting. Feeling it the most are small and medium size firms. (Practically all large metalworkers and a big percentage of medium size companies already have programs. About 13 million people are covered.

Unions, with most of their members covered, are stepping up efforts against companies without programs. The United Auto Workers reports that only 20 per cent of its members are not covered; but that represents 75 per cent of UAW contracts.

Employers find pension programs a good weapon in battling union organizational efforts, particularly where whitecollar workers are involved. They are now the unions' No. 1 target.

Pension programs help attract personnel in a competitive labor market. And they minimize employee turnover.

Upper-bracket executives are recognizing the tax advantages of deferred compensation through pension plans.

• **Planning Your Attack**—If you're caught in the pension pinch, what should you do? STEEL asked for pointers from some experts—and that should be your first step, too. In designing and establishing a pension plan, you'll probably need the services of one or more of these: Pension consultants or actuaries, banks handling pension trusts, insurance companies.

• **Building the Base**—The basic consideration is benefits: What do you want to provide for employees? Steelworker and autoworker contracts furnish a basic formula of $2.50 times years of service. Added to social security, that can mean a pension of up to $191 a month for a man retiring after 30 years.

That union plan is based on service but not earnings. Many other formulas are built on a percentage of the employee's salary at retirement, or an average for the last ten years. Some use a career average for earnings; others specify a fixed amount without regard to service or earnings.

With the retirement formula as a foundation, you can build additional features as your conscience, pocketbook, or bargaining pressures dictate. Features might include: Early retirement provision, joint and survivor clause, disability benefit, vesting privileges, death benefit. Each one you add, of course, hikes the cost of the plan (see exhibit).

• **Spotting the Trend**—The Labor Department's Bulletin 1232, "Digest of 100 Selected Pension Plans Under Collective Bargaining," will give you an idea of what is commonly included. Of the 29 large metalworkers listed . . .

. . . 22 provide disability retirement provisions after 15 years of service.

. . . 24 include vesting privileges, most with minimum requirements of age, 40, and service, 10 to 15 years.

Weigh your method of funding carefully . . .

Insured Plan	vs.	Trusteed Plan
Benefits are guaranteed by the insuring firm.		Benefit guarantees are the employer's responsibility.
Interest rates are guaranteed.		Interest is not guaranteed, but earning potential is greater.
Legal, actuarial, administrative expenses are absorbed in over-all plan.		Legal, actuarial, administrative costs are paid as incurred.
Insuring firm assumes general responsibility and control for plan.		Employer has greater flexibility in contributions, benefits, over-all control.

. . . 4 include death benefits, either before or after retirement.

• **Finding the Factors**—This information will weigh heavily on the type of plan you set up and its cost:

1. Age, sex, length of service, earnings, turnover, and mortality rate of employees.
2. Age and stability of the company, its earning record, and potential.
3. How much the company can afford.

• **Figuring Finances** — Perhaps the most difficult decision you'll have to make is how to finance the plan. The choice: An insured or trusteed program.

Edwin Shields Hewitt & Associates, independent actuaries and pension consultants, emphasize this point: Company size is not the dominant factor in selecting a method of funding. More important is the rate of funding required. This involves how soon you will have to pay benefits and the financial position of the company. Example: What are your money requirements in the short and long term?

• **Choosing the Type**—Most plans are trusteed: 21 of the 29 firms listed in the "Digest" are funded under trusteed programs, five are insured, three use a combination, one is not funded.

The two big advantages of trusteed plans are greater earnings potential and flexibility. Proponents point out that the trend in fund appreciation creates a reserve that permits lower costs over the long term and the addition of improved benefits with little or no cost.

Within limits, the employer has greater flexibility in making contributions to the trust fund. He may choose to set aside larger sums initially, or, under some actuarial assumptions and procedures, reduce the initial outlay.

• **Pooled Funds** — Robert Farwell, assistant secretary of the Continental Illinois National Bank & Trust Co., Chicago, reports increasing interest in pooled funds for medium and small size firms. Companies participate by purchasing units of the over-all fund.

The Continental Illinois Investment Trust has 161 participating firms and the current fund value is over $28 million. The advantage, says Mr. Farwell, is greater diversification. Market fluctuations naturally have a greater impact on smaller funds.

• **Cost**—Initial costs of establishing a trust fund are greater than setting up an insured program. Costs include legal fees, actuarial services, trustee costs. They vary by area, but here are rule-of-thumb costs for a firm with 200 employees: Legal, $100 to $500; actuarial services, $200 to $500; trustee, $100 to $500.

• **Insurance Plans**—Insurance companies are becoming more aggressive through new plans. They claim these advantages over trusteed plans:

1. Insurance firms provide all the services required for establishing and operating pension plans.
2. They guarantee benefits and interest rates.

Insurance companies provide a number of different programs, including plans related to profits. Here are the more common ones:

• **Individual Policy**—The employer annually purchases a unit of retirement income for the individual. Payment is normally made to a trustee—often a bank—who purchases the policy. Basic characteristics of this plan are level-premium financing for a guaranteed benefit.

• **Group Permanent**—This is similar to the above, but covers a group of employees. Employer generally deals directly with insurance firm.

• **Group Annuity**—This plan calls for annual purchase of a unit of pension benefit. The cost is determined with respect to future and past service.

• **Deposit Administration**—In this, the insurance firm handles an employer's fund. Contributions are made under contract with a guaranteed interest rate—normally 3 per cent today. As the individual retires, money is taken from the fund to purchase his annuity. This plan has some aspects of a self-funded program—if the guarantees prove conservative, the insurance pays a dividend; if the cost assumptions prove conservative, the surplus in the employer's fund will reduce subsequent contributions. This plan is often set up under an employee contribution program.

• **Cost** — Pension costs under insured programs vary with the benefits desired and the individual company. Fred Bergbauer, group pension sales manager, Prudential Insurance Co. of America, makes this generalization: For the average firm employing about 200 and granting a benefit of $2.50 times years of service, the cost will be about 10 cents per hour under a deposit administration contract.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

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POSITION _____

COMPANY _____

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Here's your chance to have a lot of fun, prove you're a better sales forecaster than Detroit's wizards, and possibly win a unique prize

LIKE TO WIN a scale model of the fabulous Firebird III? Or a full color print of a dream car rendered for you by George Walker?

All you have to do is predict the number of cars that will be built in the U. S. during the first six months (Jan. 1 through June 30) of calendar 1959. The 11 readers who come the closest to the actual production figure will be the winners.

• **The Rules**—Here's how you go about it. Fill in the entry form above and mail it to the address shown. (You'll find an entry blank in this column every week for a month, and facsimiles are acceptable.) Only one entry per man is permitted. Deadline: Entries must be postmarked before midnight, Dec. 31, 1958. Anyone, except employees of The Penton Publishing Co., may enter.

• **The Judge** — *Ward's Automotive Reports*' first preliminary production figures will be the final authority. We're using preliminary figures because they'll be available early (mid-July), so the winners can be an-

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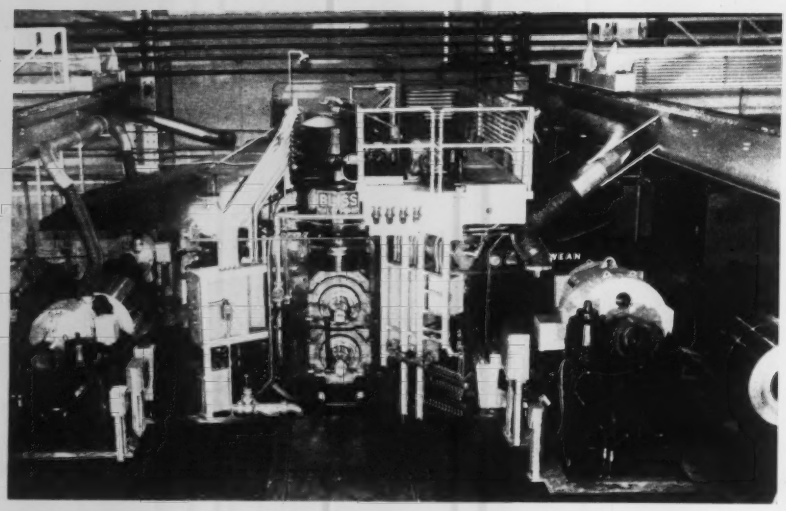

THIS 66-IN. BRIGHT MILL will cold roll aluminum sheets for automakers, trailer producers, and other industries requiring an extremely bright finish. It's at Reynolds Metals Co.'s Sheffield, Ala., plant. Designed and built by E. W. Bliss Co., the 2-high, single stand unit has a top speed of 1000 fpm

nounced as soon as possible.

• **The Prizes**—This contest is designed primarily for fun. We think you'll enjoy trying to "beat the experts." The winner will receive a scale model of General Motors Corp.'s experimental Firebird III. The unique conversation piece will be built for STEEL by GM.

The ten runners-up will win full color prints of a dream car rendered for STEEL by George Walker, vice president and director of styling, Ford Motor Co. His thinking in automotive design and styling ideas will make the prizes interesting to metalworking readers.

• **A Hint**—Round figures won't do; you can't expect to guess 1.1 million and win. Your chances will improve if you use a seven-digit figure—2,543,321, for example. In case of ties, the earliest postmarked entry will win.

• **Two Rounds**—A second contest, in which you'll predict production for the full year, 1959, will start in a few months. We'll have the details on that later.

Woos Cost-Minded Buyer

Studebaker-Packard Corp. will gear its 1959 truck marketing plans to cutting costs for the operator. "We believe truck buyers are increasingly aware that costs are a big part of their business," explains S. A. Skillman, vice president and general sales manager.

S-P has introduced its new Scotsman six and V-8 ½-ton trucks and its Transtar series, ½ through 2 tons.

The firm is bucking the trend toward stylized trucks, Mr. Skillman adds. His company's Scotsman pickup is said to cost less than any other truck on the market to operate and is the most economical to maintain. He maintains that S-P's success in selling the truck in 1958 proves that buyers are cost conscious.

S-P's theme is extended to its new Econ-O-Miler, a taxicab designed for economy of operation and low maintenance cost. It's the only taxicab built specifically for the market by a major automaker. S-P entered the field in the 1958 model year.

Truck Trends: Up in 1959

Look for truckmakers to surge forward next year on a rising tide of construction work and general industrial requirements. Operators will step up the replacement of obsolete and worn-out vehicles, predicts the *Value Line Industrial Survey*.

The survey estimates 1959 production will include at least 625,000 trucks for replacement, 275,000 to handle growing demand, and 200,000 for export markets. Gains are likely to be greatest for heavy truck producers. That's good news for independent manufacturers specializing in heavy trucks (such as Mack Trucks Inc., New York, and White Motor Co., Cleveland).

The sales outlook for the early-sixties is also bright. Helping truckmakers grow will be increases in residential and highway construction and decentralization of industrial plants.

Truck output this year will reach an estimated 900,000 units, the survey estimates. That's a 17 per cent drop from 1957's total (1,086,000 units).

Ford Makes Fast Start

Early returns are in on '59 Fords, and they're excellent, company officials report. J. O. Wright, Ford Motor Co. vice president and division general manager, says the first ten-day sales period was second best in the company's history—topped only by 1955 model sales.

Ford dealers delivered 43,000 new cars—an improvement of 20 per cent over early 1957 model results and 4 per cent better than the 1958 figure.

U. S. Auto Output

Passenger Only

	1958	1957
January	489,357	642,090
February	392,112	571,098
March	357,049	578,826
April	316,503	549,239
May	349,474	531,365
June	337,355	500,271
July	321,053	495,628
August	180,324	524,354
September	130,426	283,852
October	261,696	327,363
10 Mo. Total	3,135,349	5,004,086
November		578,601
December		534,714
Total		6,117,400

Week Ended	1958	1957
Oct. 11	34,834	38,526
Oct. 18	45,387	72,180
Oct. 25	70,973	104,987
Nov. 1	97,804	126,139
Nov. 8	128,272†	136,742
Nov. 15	145,000*	141,902

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

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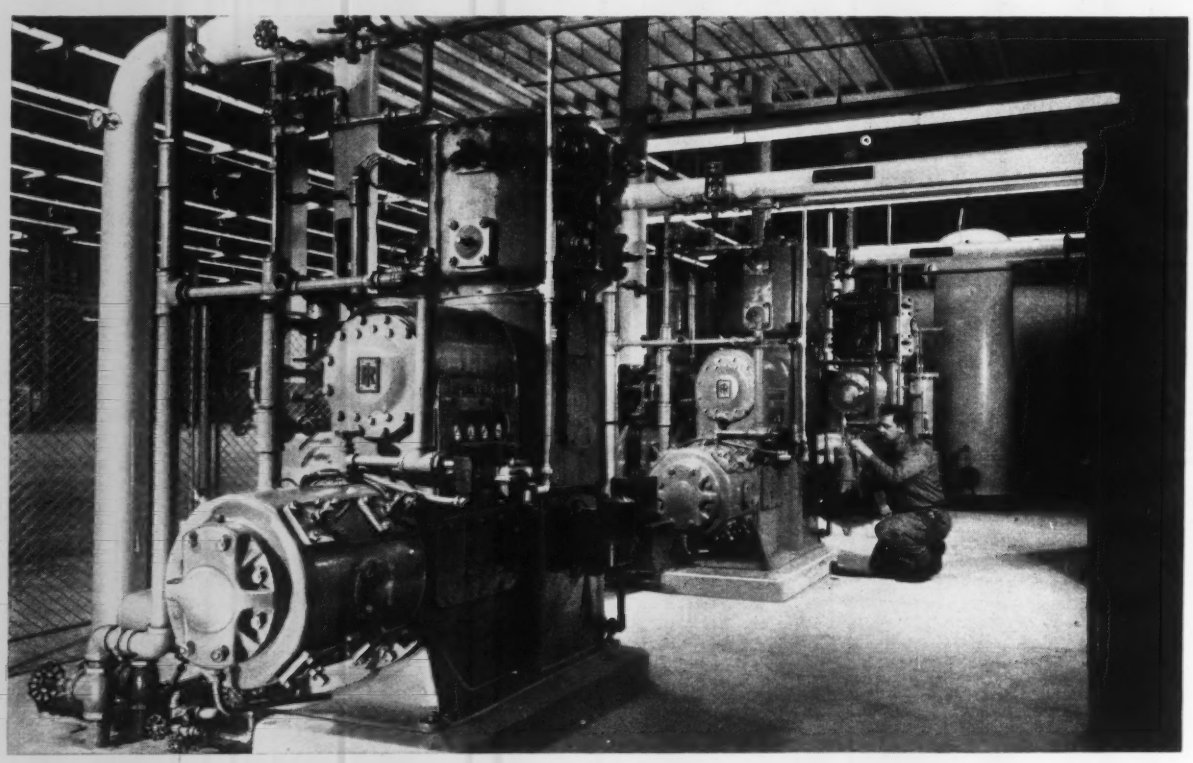
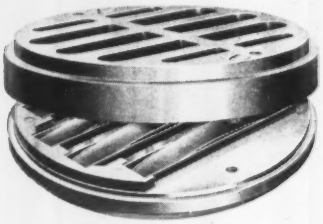


Ingersoll-Rand XLE compressors provide dependable plant air for North American Aviation—specialists in supersonic flight

At North American Aviation's Los Angeles (Calif.) Division—where tomorrow's supersonic flight is being developed today—these three Ingersoll-Rand XLE compressors are on duty around the clock, providing a never-failing supply of air power.

These modern packaged-design compressors save valuable floor space and are shipped fully-assembled, ready to install on a simple foundation. "Thru-frame" air flow eliminates interstage piping. Full-floating aluminum bearings are foolproof—sealed crankcase never needs to be opened for bearing adjustment, so dirt (the major cause of wear) is kept out of the oil. All moving parts are pressure-lubricated. Push-button starting and simplified operation are standard, and fully-automatic or remote controls can be supplied if desired.

These XLE compressors are built in sizes from 125 to 350 hp—other Ingersoll-Rand compressors are available from ½ to 6000 hp. Contact your I-R representative for help with your compressor problems.



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The heart of any compressor is its valving . . . Cut valve replacement and you've solved the No. 1 compressor maintenance problem. Ingersoll-Rand Channel Valves do just that. They are known the world over for remarkable durability, high efficiency and quiet operation. They are entirely different from any others—each valve is a combination of straight-lifting stainless-steel channels and leaf springs, with trapped-air spaces which cushion action and prevent impact. And only I-R compressors have Channel Valves.

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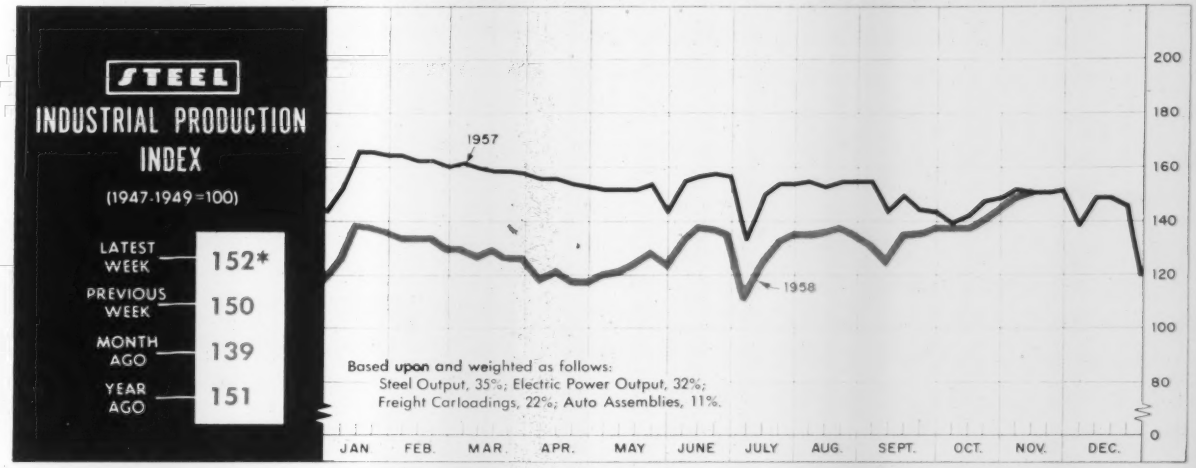

*Week ended Nov. 8.

Autos Push Production to New Highs

STEEL's industrial production trend line has crossed the year-ago line for the first time in over a year and is within striking distance of the pre-recession level.

The key automotive industry has been responsible for the recent gains in production—its inactivity was the main reason for the sluggishness of the recovery through most of September and October. With additional help from the electric utilities, the index climbed to a 1958 high during the week ended Nov. 8 —a preliminary 152 (1947-49 = 100). Not since the week ended Nov. 23, 1957, has the indicator pushed above the 150 mark. It is now only 3 percentage points below the average level in August, 1957, which should be surpassed within a week or two.

• **Delayed Action**—Peak operations in motordom are being scheduled for December, about a month or so later than industry officials originally planned. Late October and early November sales reports have prompted producers to boost their November schedules to 533,000 units, December's to 594,000, says *Ward's Automotive Reports*. You have to go back to January, 1957, to find production at that pace. Truck output is reaching a two-year high.

The direct effect of auto activity on the index will be the addition of 5 or 6 points to the current reading. Indirectly, it will show up in higher steel production, electricity output, and freight carloadings as metalworking plants push to meet the unusual demand for parts. *Ward's* reports that some auto plants are expediting the delivery of essential parts by airplane.

• **Steelmakers Wait**—The steel mills have not felt the effects of overtime scheduling at auto plants, but they will within a week or two. After hitting the year's high point of 2,026,000 net tons for ingots and castings during the last week in October, the production pace has slackened only minutely. But out-

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,029[1]	2,011	1,990
Electric Power Distributed (million kw-hr)	12,350[1]	12,330	11,914
Bituminous Coal Output (1000 tons)	8,585[1]	8,460	9,866
Crude Oil Production (daily avg—1000 bbl)	6,900[1]	6,911	6,796
Construction Volume (*ENR*—millions)	$221.5	$272.9	$147.9
Auto, Truck Output, U. S., Canada (*Ward's*)	161,271[1]	122,558	167,879
TRADE			
Freight Carloadings (1000 cars)	642[1]	674	675
Business Failures (Dun & Bradstreet)	299	275	250
Currency in Circulation (millions)[3]	$31,419	$31,299	$31,114
Dept. Store Sales (changes from year ago)[3]	+5%	+6%	−2%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$21,712	$22,079	$21,630
Federal Gross Debt (billions)	$280.2	$280.7	$273.7
Bond Volume, NYSE (millions)	$24.5	$26.1	$21.6
Stocks Sales, NYSE (thousands of shares)	15,920	19,464	9,666
Loans and Investments (billions)[4]	$93.9	$94.1	$86.7
U. S. Govt. Obligations Held (billions)[4]	$31.6	$31.9	$25.2
PRICES			
STEEL's Finished Steel Price Index[5]	247.82	246.65	239.15
STEEL's Nonferrous Metal Price Index[6]	217.2	215.6	206.3
All Commodities[7]	118.7	118.6	117.5
Commodities Other than Farm & Foods[7]	126.2	126.1	125.6

•Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1958, 2,699,173; 1957, 2,559,490. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

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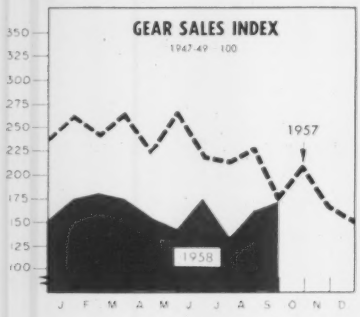
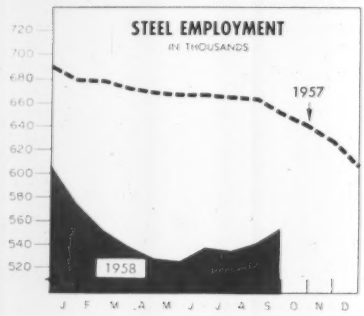
THE BUSINESS TREND





	1958	1957	1956	1955
Jan.	174.5	259.3	245.5	140.9
Feb.	179.1	239.5	256.2	148.5
Mar.	173.7	262.4	276.5	172.8
Apr.	153.2	221.7	264.7	179.8
May	142.2	263.2	275.6	205.2
June	173.8	215.9	245.4	193.5
July	133.3	211.4	286.7	201.7
Aug.	162.1	225.8	219.5	217.6
Sept.	170.7	174.9	230.5	246.5
Oct.	....	207.0	299.8	227.6
Nov.	....	165.3	216.2	210.4
Dec.	....	150.8	235.7	245.5
Avg	....	216.4	254.4	198.3

American Gear Mfrs. Assn.

	Employment in Thousands 1958	Employment in Thousands 1957	Payroll in Millions 1958	Payroll in Millions 1957
Jan.	575	678	$297.4	$360.4
Feb.	554	677	261.7	327.5
Mar.	539	671	271.8	344.2
Apr.	529	668	259.1	331.5
May	527	666	270.1	338.0
June	538	666	278.6	324.8
July	536	665	280.1	334.6
Aug.	542	663	299.1	343.7
Sept.	555	651	308.1	330.1
Oct.	....	640	....	345.6
Nov.	....	626	....	316.3
Dec.	....	606	....	299.6

American Iron & Steel Institute

Charts copyright, 1958, STEEL.

put for the week ended Nov. 16, should be back to about 75.5 per cent of capacity. By the end of the year, 80 per cent may be reached as demand peaks.

The third factor in establishing new highs in the next two months will be output of electricity. For the last few weeks, generation of power has been at a rate about 3 to 4 per cent above the year-ago levels. That gap should widen in the coming weeks, partly because of the faster pace of business this year and partly because of the general decline which influenced the year-ago figures. It's likely that the industry will break through the 13 billion kw-hr a week barrier in December.

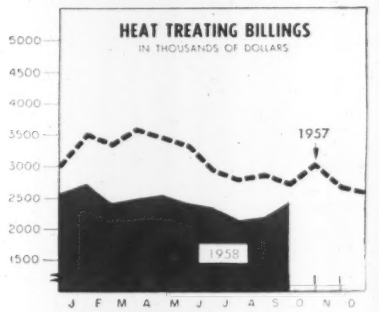
• **Better than Expected** — Freight carloadings are showing unexpected strength. In the third quarter, the shippers' advisory boards of the Association of American Railroads expected loadings during the fourth quarter to be about 6.2 per cent below the year earlier level. During the latest period, the gap was only 5.5 per cent, even though the Great Lakes ore fleet is tying up earlier than it did last year. A pickup in miscellaneous freight (including metalworking) and forest products should minimize the seasonal decline in carloadings.

C of C Economist Cautions

Word comes from the Chamber of Commerce of the U. S. that the fourth quarter is going to be the best of the year and that we can look forward to a good entry into 1959. But Dr. Emerson P. Schmidt, director of the chamber's Economic Research Department, feels that the outlook may appear a little more favorable than it really is.

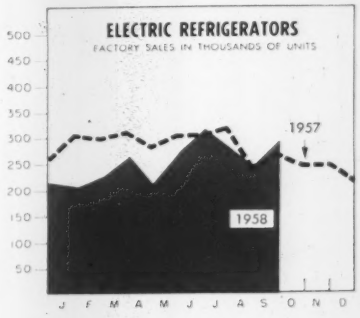
He points out that we have just come through one of the three or four shortest business contractions in the last 104 years. "In only a few cases in this period have we had what we call a double bottom in a recession," he claims. "Since the current recovery is so broadly based . . . many feel the possibility of a double bottom is rather remote."

Dr. Schmidt sees several weak spots in the upturn. He questions the extent of the reported upturn in plant and equipment expenditures. Reason: Idle plant capacity comes to about 30 per cent. Foundries and machine tool makers have not felt any significant upsurge. But he admits that "if the government's forecast (for an upturn this quarter) is correct, then the recovery is even more strongly based than has been indicated up to now."



	1958	1957	1956
Jan.	2,780.4	3,533.9	3,116.4
Feb.	2,436.4	3,378.9	3,124.8
Mar.	2,495.4	3,631.8	3,330.9
Apr.	2,542.6	3,572.4	3,166.2
May	2,421.5	3,389.6	3,350.7
June	2,374.8	2,912.1	3,094.5
July	2,139.6	2,767.5	2,737.4
Aug.	2,213.0	2,830.8	3,136.6
Sept.	2,457.1	2,765.0	2,858.6
Oct.	.....	3,021.6	3,468.5
Nov.	.....	2,641.4	3,238.2
Dec.	.....	2,565.4	2,998.9

Metal Treating Institute.



	1958	1957	1956
Jan.	206,100	305,400	308,900
Feb.	228,800	298,700	316,000
Mar.	261,100	309,300	403,500
Apr.	210,800	281,600	353,300
May	262,900	303,700	346,800
June	316,300	305,100	354,400
July	279,700	318,000	351,000
Aug.	245,900	240,500	307,600
Sept.	294,800	265,200	277,300
Oct.	.....	245,500	212,200
Nov.	.....	246,400	211,600
Dec.	.....	214,600	257,400
Totals	.....	3,334,000	3,700,000

National Electrical Mfrs. Assn.

Another weak spot is manufacturers' new orders. They are still below the year-ago level, having moved up only about $1 billion since the low point in the recession. The increase in paperboard production indicates high Christmas sales, Dr. Schmidt contends, but "that is about all it does suggest."

Housing, which has picked up this year, is in for some trouble in the near future because of mortgage problems, he suggests. Another potential drawback: Outstanding installment credit is still above the year-ago level.

While automobile sales may climb to about 5.5 million units next year, Dr. Schmidt claims the figure is still below the "normal" industry level (6 million). Farm income has been declining lately, and he feels that it will be generally lower in 1959. Foreign economies are leveling off or declining, which may weaken one of the buoyant factors in our economy in recent years.

Wage settlements in general have been on the inflationary side, he feels, although auto agreements have been only mildly so. If the steel people "can continue that kind of settlement in the next 6 to 12 months, we can do a good deal to take pressure off prices," he declares.

Productivity is increasing at about twice the rate of the last two years, which will help fight inflation.

The fact that our money supply is about $12 billion higher than it was a year ago has been "the most important factor in shortening and ameliorating the recession." But he points to the federal budget as one of the most serious difficulties that lies ahead. The predicted deficit of $13.7 billion may be cut to somewhere between $9 billion and $11 billion because of rising revenues.

Trends Fore and Aft

• Eight out of ten companies surveyed by Dun & Bradstreet Inc. expect to increase sales volume by a median of 28 per cent by 1965, 100 per cent by 1975.

• Forty-eight per cent of the Chicago purchasing agents replying to the monthly survey of their association report: They plan to increase spending for replacement of capital equipment in the next year to increase efficiency.

• Manufacturers' inventories in September totaled $85 billion, seasonally adjusted, down $400 million from August, the Commerce Department says.

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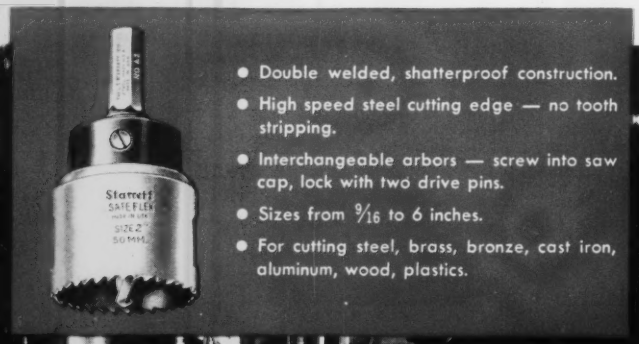

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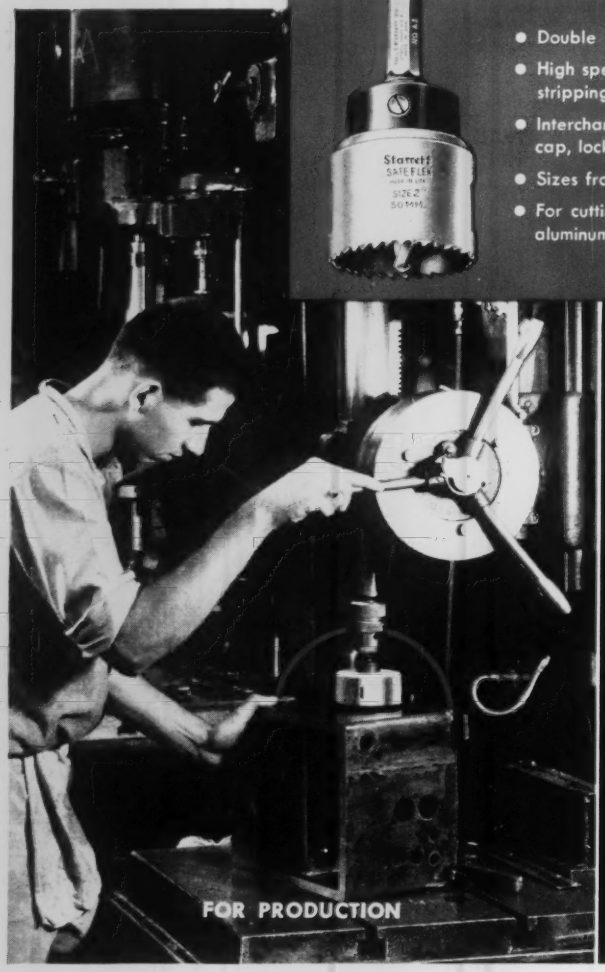
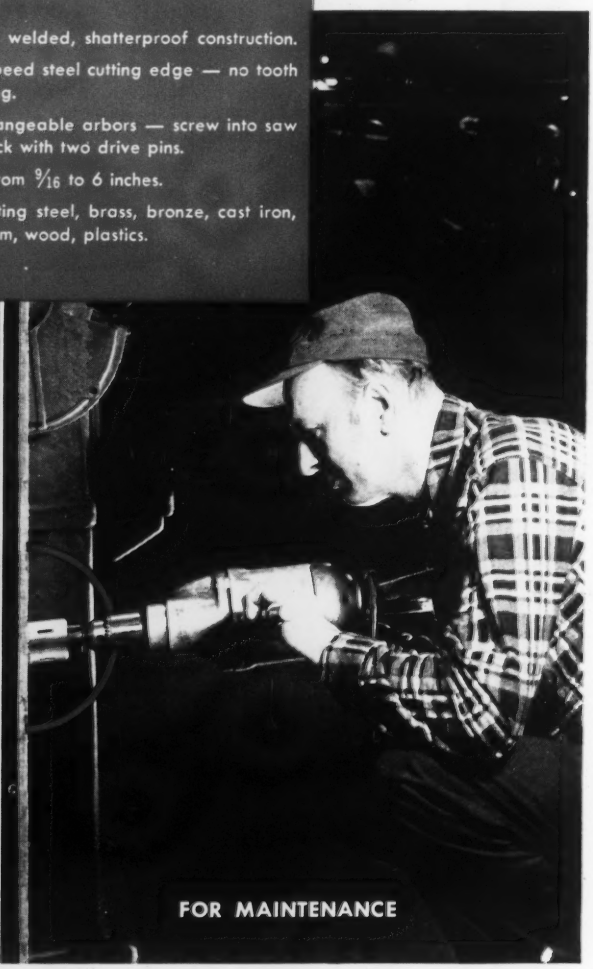
- Interchangeable arbors — screw into saw cap, lock with two drive pins.
- Sizes from 9/16 to 6 inches.
- For cutting steel, brass, bronze, cast iron, aluminum, wood, plastics.





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Starrett SAFE-FLEX High Speed Welded Edge Hole Saws are available in sizes from 9/16" through 6" diameter. Interchangeable arbors accommodate a wide range of saw sizes; come with 1/4" pilot drill and 7/16" or 5/8" hexagon shank or 1/4" round shank; can be used with portable power tools, lathes, drill presses, radial drills, other machine tools.

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DANIEL R. SIMMONS
Ainsworth-Precision purchasing

FRED F. MILLER
Gear Grinding v. p.-eng.

SWAN E. BERGSTROM
Cincinnati Milling president

ROBERT L. BOBO
Federal Pacific marketing v. p.

Ainsworth-Precision Castings Co., Detroit, appointed **Daniel R. Simmons** director of purchases; **George M. Rice**, automotive sales manager. Mr. Simmons was purchasing agent, Continental Div., Ford Motor Co. Mr. Rice was in charge of sales and advertising for Ren Plastics Inc.

Fred F. Miller was promoted to vice president-engineering, **Gear Grinding Machine Co.**, Detroit. He was vice president of Detroit Bevel Gear Co., until recently a subsidiary.

Clarence B. Noelting was elected president of **Faultless Caster Corp.**, Evansville, Ind. Former executive vice president, he succeeds his late brother, **William H. Noelting. Walter W. Noelting** was elected executive vice president and secretary.

William Jaynes was made product manager of bearing bronzes by **Meier Brass & Aluminum Co.**, Detroit.

Arthur C. Buesing was named vice president-foundry sales by **Brown Thermal Development Co.**, Elyria, Ohio. He was with the Gray Iron Research Institute, Columbus, Ohio.

J. L. Montgomery was named product sales manager, plant equipment, **Blaw-Knox Co.**, Pittsburgh. He was assistant product sales manager.

J. Eric Heyworth was appointed superintendent of the mechanical department at the Cleveland district steel plant of **Republic Steel Corp.** He is succeeded by **Joseph H. Snayd** as assistant superintendent.

Swan E. Bergstrom was elected president, **Cincinnati Milling Machine Co.**, Cincinnati. He succeeds **Frederick V. Geier**, who was elected chairman, with responsibilities of chief executive officer. Mr. Bergstrom has been executive vice president since 1956.

V. R. Bates was named vice president-marketing; **T. R. Adams**, vice president-commercial; **E. B. Mason**, manager-commercial research at **Detroit Steel Corp.**, Detroit. Mr. Adams, former vice president-eastern operations, moves to Detroit to direct field sales force.

John S. Throne was appointed general sales manager, **Borger Steel Co.**, York, Pa. He was sales manager of the special machinery and ordnance departments of A. B. Farquhar Div., Oliver Corp.

H. E. Williams Jr. was made purchasing agent, **Saco-Lowell Automotive Div.**, Saco-Lowell Shops, with headquarters in Saco, Maine.

Robert D. Hawkins was named production superintendent, **Republic Rubber Div.**, Lee Rubber & Tire Corp., Youngstown. **R. W. Deemer** resigned as factory manager.

Marvin B. Smith was made director of production programming and procurement by **Chrysler Corp.'s** Airtemp Div., Dayton, Ohio.

John B. Moxness was made market manager of pyrometer supplies and accessories, **Brown Instruments Div.**, Minneapolis - Honeywell Regulator Co., Philadelphia.

Robert L. Bobo was elected vice president-marketing, **Federal Pacific Electric Co.**, Newark, N. J. **Harry E. Knudson Jr.** was appointed general sales manager, succeeding Mr. Bobo. Mr. Knudson was manager, middle Atlantic sales region.

Walter F. Craig Jr. was made manager of metallurgical development of **Climax Molybdenum Co.**, New York, division of American Metal Climax Inc. He succeeds **Norman L. Deuble**, named to head a task force organized to develop uses of molybdenum metal and molybdenum-base alloys. **John L. Goheen** was named assistant manager, Los Angeles office.

Francis H. Hohn succeeds **Frank X. Hohn**, retired, as chief metallurgist, **Scullin Steel Co.**, St. Louis, division of Universal Marion Corp.

Armco Steel Corp., Middletown, Ohio, promoted three associate directors in the research division: **R. L. Kenyon** was made assistant to the vice president-research. **R. S. Burns** and **V. W. Carpenter** were advanced, respectively, to director of metallurgical research, and director of magnetic materials research.

Carleton A. German was promoted to industrial sales manager, **Solventol Chemical Products Inc.**, Detroit.

John D. Williams was elected president, **Lipe-Rollway Corp.**, Syracuse, N. Y. He succeeds **H. Follett Hodgkins Sr.**, now chairman. **Robert M. Zimmerman** was elected vice president. **H. Follett Hodgkins Jr.** was named vice president of the

CLYDE E. SMITH
Oberg Mfg. plant mgr.

ARNOLD C. BENNETT
Black-Clawson div. post

JACK ROSENBERG
ECS engineering manager

J. B. COWAN
Saranac president

subsidiary, Rollway Bearing Co. Inc.

Clyde E. Smith, former chief engineer, was made plant manager of **Oberg Mfg. Co. Inc.**, Tarentum, Pa.; **John C. Vecchi**, assistant plant manager. **Edward S. Hilty** was made sales manager; **Claude V. Schrecengost**, assistant sales manager. **Carleton E. Wagner** was made chief engineer; **Leslie T. Wohlin**, assistant chief engineer.

Herbert H. Upton and **Thomas Hollis Jr.** were elected vice presidents of **Brown & Sharpe Mfg. Co.**, Providence, R. I. Mr. Upton continues as general manager, hydraulics division, and president of the subsidiary, Double A Products Co., Manchester, Mich. Mr. Hollis continues as general manager, cutting tool division, and president of the subsidiary, Nelco Tool Co., Manchester, Conn.

Dumore Co., Racine, Wis., appointed **Tom Carroll** vice president-sales; **Harry Wardrip**, sales manager.

Republic-Odin Appliance Corp., Los Angeles, announces executive appointments, following its recent acquisition of Fowler Mfg. Co., Portland, Oreg. **William B. Lennon** was made executive vice president. As general manager of the Erie, Pa., operations, he will spearhead the eastern expansion program. **H. F. Scott** was made vice president, continuing as national sales manager. **Gordon Copeland**, manager of the Los Angeles facility, was made vice president - general manager, west coast operations. **Hazel Barrow**, head of purchasing, was named vice president-procurement. **Fred Fowler** was elected president of the new Fowler Div.; **Archie Schweiso** vice president and plant manager.

Arnold C. Bennett was appointed plant manager, paper machine division, **Black-Clawson Co.**, Watertown, N. Y. He is in charge of operations in the foundry and two machine shops of the plant. Mr. Bennett was with Allen-Sherman-Hoff Co.

Jack Rosenberg was appointed manager of engineering for **Electronic Control Systems**, Los Angeles, Stromberg-Carlson Div., General Dynamics Corp. He was project engineer in charge of development of the Digimatic controls for machine tools and other precision equipment.

Robert J. Laws was made general sales manager, **Baker Industrial Trucks Div.**, Otis Elevator Co., Cleveland. He succeeds **R. T. Tiebout**, resigned. Mr. Laws was assistant general sales manager.

George C. Morgan was named a vice president of **G. A. Gray Co.**, Cincinnati. He was with Continental Gin Co., Birmingham, most recently as vice president-industrial division.

Felix La Mar fills the new post of western manager, **Modern Engraving & Machine Co.** He is in Palo Alto, Calif.

Carey A. Evans was appointed manager of engineering, electronics and instrumentation division, **Baldwin-Lima-Hamilton Corp.**, Waltham, Mass.

Alexander Korbelak was made manager, marketing and new product development, precious metals division, **Sel-Rex Corp.**, Nutley, N. J. He was sales manager of the division.

J. B. Cowan was elected president of **Saranac Corp.**, Washington, Pa. He also is executive vice president of Plasteel Products Corp., with which he has been associated since 1945.

James P. Gill, president of **Vanadium-Alloys Steel Co.**, Latrobe, Pa., was elected chairman and president. As chairman he succeeds the late **Roy C. McKenna**.

C. R. Welles was made vice president-sales, **Hanna Furnace Corp.**, Buffalo, subsidiary of National Steel Corp.

Earl Schwenk Jr. was made manager, sheet and strip department, **Production Steel Co.**, Broadview, Ill.

Lynford P. Shollenberger joined the sales force of **Wisconsin Steel Div.**, International Harvester Co., Chicago.

Link-Belt Co. appointed **T. W. Matchett** assistant general manager of its Caldwell plant in Chicago. He is succeeded as Chicago district manager by **John D. Riley**. **Harry G. Andersen** replaces Mr. Riley as Cleveland district manager, and in turn is replaced as district manager at Summit, N. J., by **Harry M. Horton**.

F. T. Snyder was named administrator-engineering services; **E. S. Falsetti**, assistant administrative manager-technology by **Electro Metallurgical Co.**, Niagara Falls, N. Y., division of Union Carbide Corp.

Clark L. Hastings was elected president of **Rochester Mfg. Co.**, Roch-

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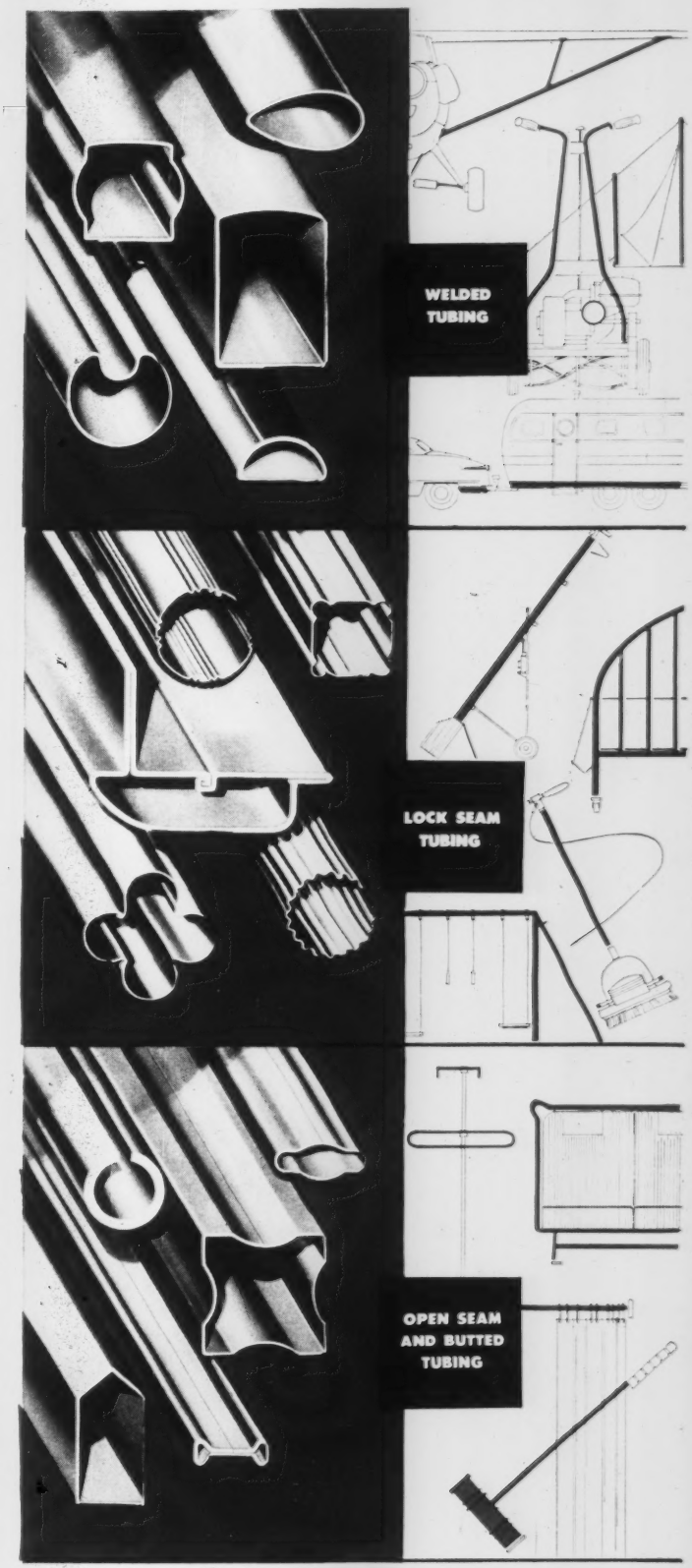


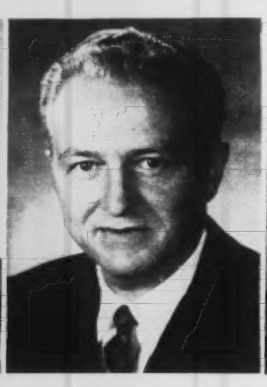
where ideas take shape

E. L. KAUFFMAN
Chester Hoist gen. mgr.

GEORGE R. SYLVESTER
heads Continental Coatings

DR. ROBERT J. ROHR
Magnus Chemical research-dir.

F. A. WAGONER
Ford tractor plant eng. post



RALPH C. SCHIRING
heads Waite Mfg. Div.

A. BRENT WILSON
Harbison-Walker exec. v. p.

ester, N. Y. He was vice president-sales and advertising.

F. A. Wagoner was made manager, plant engineering department, Highland Park, Mich., tractor plant, **Ford Motor Co.** He was production manager.

Ralph C. Schiring was elected president of Picker-X-Ray Corp.'s **Waite Mfg. Div.**, Cleveland. He succeeds **Edwin C. Goldfield**, retired. He was elected a vice president in 1956.

Leo I. Dana was appointed vice president-technology; **David Swan** vice president-research for **Linde Co.**, New York, division of Union Carbide Corp.

A. R. Sloan was made manager of **Continental Can Co.'s** Stockton, Calif., can plant. He replaces **Jesse V. Leishman**, retired.

Jerry Ross was made manager, equipment division, **Sel-Rex Corp.**, Nutley, N. J.

A. Brent Wilson was appointed executive vice president, **Harbison-Walker Refractories Co.**, Pittsburgh. **A. L. Garber** remains as president and chief executive officer. Mr. Wilson will assist him, and in the absence of Mr. Garber will perform duties of president.

Carl W. Jarnberg was named vice president in charge of design for **Anderson Machine & Tool Works**, St. Paul. He also is president of Jarnberg Design & Mfg. Inc.

Ben Poleniecki was made general manager, **Chain Bike Corp.**, Rockaway Beach, N. Y. He was plant superintendent.

Robert N. Babbish fills the new post of assistant district sales manager in Detroit for **Jones & Laughlin Steel Corp.'s** stainless and strip division.

Harry B. Randall Jr. was made New York district manager, **Pratt & Whitney Co.**, to succeed **Joseph G. Brady**, retired.

E. L. Kauffman was named general manager, **Chester Hoist Div.**, National Screw & Mfg. Co., Lisbon, Ohio. He was plant manager.

George R. Sylvester, president of Sylvester & Co., Cleveland, engineering concern, was elected president of the reorganized and recapitalized **Continental Coatings Corp.**, Cleveland. The firm holds exclusive world rights to the flame ceramics process developed by Armour Research Foundation, Chicago. **Ben G. Jones**, sales manager, is in charge of its branch office in Chicago.

Dr. Robert J. Rohr was appointed director of research and development of **Magnus Chemical Co. Inc.** He has office and laboratory facilities in Chicago.

Robert F. Groves was made director of personnel relations for **Glidden Co.**, Cleveland. His duties include responsibility for the personnel relations department, as well as negotiation of labor contracts.

Norman E. Bonn was made director of research of **Pyrometer Co. of America**, Penndel, Pa. He held a similar post at Rubicon Instrument Co.

John W. Bodwell and **Robert T. Harvey** were appointed assistant general managers of sales for **Joseph T. Ryerson & Son Inc.**, Chicago.

OBITUARIES...

Allan S. Bixby, 60, general manager, Melrose Park, Ill., plant, **National Malleable & Steel Castings Co.**, died Nov. 6.

Ray W. Turnbull, 68, retired western regional vice president, San Francisco, **General Electric Co.**, died Nov. 8.

Edward M. Klopfleisch, 60, assistant superintendent of foundry maintenance, West Allis, Wis., Works, **Allis - Chalmers Mfg. Co.**, died Nov. 1.

Milton L. Cornell, 74, president, **Cornell Iron Works**, Long Island City, N. Y., died Nov. 5.

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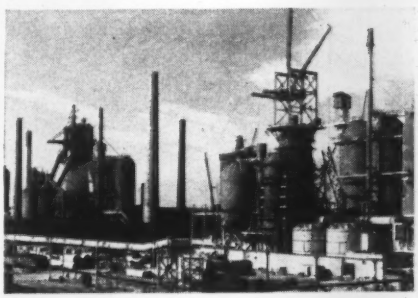

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A Marion type 5760 stripping shovel in action. The dipper could fill two railroad cars in a single pass.

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These are a few of the reasons why Farrel gears are "naturals" for the main-hoist drive in the largest power shovels ever built. Made by Marion Power Shovel Company, these giant machines have dipper capacities as high as 75 cubic yards.

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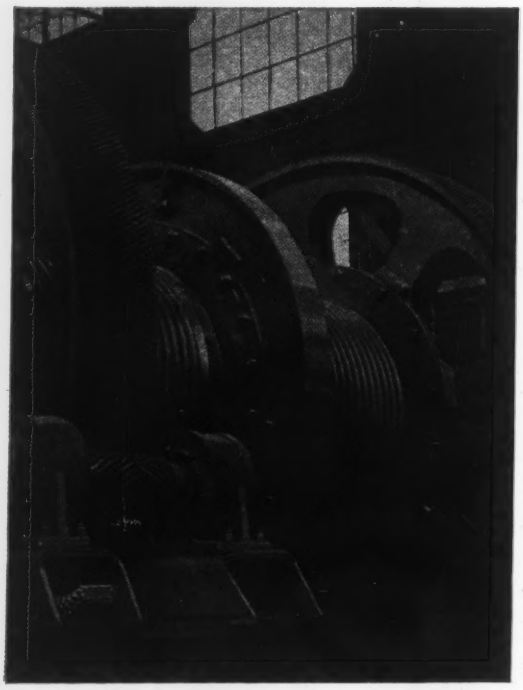

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Canco Slashes Operating Costs

Formal opening of coil processing plant at Hillside, N. J., marks completion of $32-million assault on the rising costs of producing metal containers. More improvements planned

EFFICIENCY in canmaking has reached new heights at plants of American Can Co., New York. Formal opening of the firm's Hillside, N. J., coil plant marks the completion of a $32-million capital expansion program. Its purpose: To provide facilities for processing tin plate from coils.

Hillside is the eighth coil processing center Canco has put into operation in the last 18 months. The others are at St. Louis; Milwaukee; Houston; Tampa, Fla.; Hammond, Ind.; Los Angeles and Oakland, Calif. They handle inspection, shearing, and other operations previously done by steel mills. They will supply up to 85 per cent of the firm's needs for its metal container plants in this country.

• **Cost Cut**—William C. Stolk, president, says: "The great single purpose of the coil program is to reduce operating costs. Success of the project opens the gateway to a new era of can manufacture—an era of new machines, processes, techniques, and perhaps materials which not even the most visionary of us could have foreseen only a few years ago.

"Our coil processing program brings to canmaking a new dimension of efficiency that will result in more uniform and higher quality containers. We are chemically treating steel plate for the manufacture of tinless cans at our Hammond coil center. The prospects are that it is only a matter of time before we have chemical treating lines feeding plate in continuous strip directly into inspection and shearing lines.

"The next step will be to enamel the plate in continuous strip." Continuous lithography probably will follow. "The ultimate step will be to feed chemically treated, enameled or lithographed plate in coil form directly into the canmaking equipment without ever shearing it into plates."

• **The Plant**—Hillside plant's seven coil-processing lines are in a structure containing 240,000 sq ft of floor area. The lines have an annual capacity of 194 million sheets (344,000 tons) of tin and steel plate. Manager of the plant is Tracy A. Burnham.

Awards Building Contracts

Universal-Cyclops Steel Corp., Bridgeville, Pa., has placed final contracts covering the erection of a pilot plant for the production of molybdenum, its alloys, and other refractory and reactive metals. The contracts were placed under the prime contract (about $3 million) which was recently awarded to Universal-Cyclops by the Industrial Planning Div., U. S. Navy Bureau of Aeronautics.

Builds Two Slabbing Mills

Blaw-Knox Co., Pittsburgh, has manufactured universal slabbing mills and auxiliary equipment for installation at the Gary (Ind.) Steel Works of U. S. Steel Corp. and at the Fontana (Calif.) Works of Kaiser Steel Corp. Both units include a 46 by 90 in. horizontal mill with a 38 by 84 in. vertical edging mill. Electrical equipment was purchased separately. Kaiser expects to begin operation of the new facility shortly; U. S. Steel, late this year.

Cayuga Machine Expands

Cayuga Machine & Fabricating Co. Inc., Depew, N. Y., has tripled the production capacity of its plant. The sales, engineering, and general business offices are housed in the new building. The company makes automatic welding equipment and complete tank welding production lines.

Builds Iron Pipe Plant

An automated plant with newly developed equipment for the manufacture of cast iron pipe has been completed at Bensenville (Chicago), Ill., for James B. Clow & Sons Inc. The plant covers more than 100,000 sq ft of floor space. Cast iron pressure pipe, 6 to 16 in. in diameter, in 18-ft lengths, will be made by the metal mold process. Cost: $6.5 million. The general contractor was Leonard Construction Co., Chicago.

Consolidates Departments

Traffic and general purchasing departments of the American Zinc, Lead & Smelting Co., St. Louis, have been consolidated. N. S. Worrell, vice president, is responsible for the administration of the combined departments. E. K. Minear has been promoted to purchasing agent.

Opens Diecasting Plant

Cast-O-Matic Corp. has opened a zinc and aluminum diecasting plant at Industrial Park, Syracuse, N. Y. President of the new firm is J. J. Punke.

W&S Forms Instrument Div.

Warner & Swasey Research Corp. has been made the Control Instrument Div. of the parent firm, Warner & Swasey Co., Cleveland. W. S. Tandler is manager of the division. Headquarters for sales engineering and manufacturing of the division is at 34 W. 33rd St., New York, N. Y.

Offers Electronic Devices

Clark Controller Co., Cleveland, has added a line of photoelectric and other electronic devices for control, safety, counting, and measuring applications. The former owner of the line, Electronic Controls Corp., Detroit, will make the products for Clark.

Filtermaker Extends Line

Purolator Products Inc., Rahway, N. J., producer of automotive filters, plans to expand its activities in industrial filtration, including nuclear power, aircraft and missile manufacturing, and process industries.

Simplex Buys IBM Division

Simplex Time Recorder Co., Gardner, Mass., purchased International Business Machines Corp.'s Time Equipment Div., effective Dec. 1, 1958. Paul S. Wells, general man-

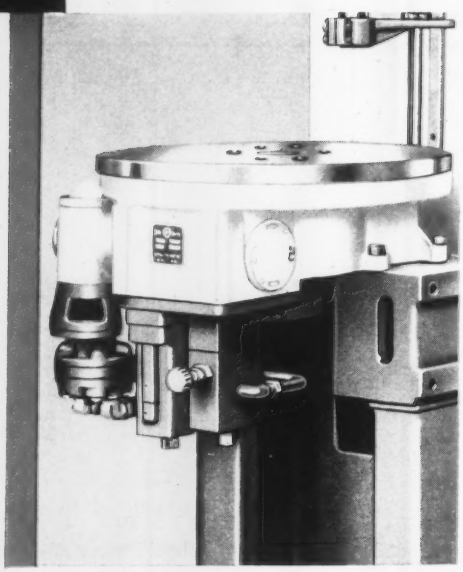
(*Please turn to Page* 88)

MEET THE NEWEST H-P-Ms . .

- 5, 10 and 15 Ton Models
- Completely JIC — All Models
- 2 Manual — 2 Automatic Systems
- All Controls Completely Interchangeable
- Small, Fast, Compact— Ideal For Automation
- Heavy Rugged Frames— Minimum Deflection
- Long Stroke — Plenty of Daylight
- Positive Ram Guides
- Complete Line Of Standard Accessories

THE FINEST INDEX TABLE-PRESS COMBINATION ON THE MARKET

The rugged H-P-M Index Table is designed specifically for use with the C-Frame hydraulic press. High speed and high load capacity effect a definite cost saving in the operator's time—no slowing the operation to suit the press. Indexing rate is fully adjustable and either clockwise or counter-clockwise rotation is available. Anti-friction bearings are used throughout—no bushing wear or tool misalignment can occur. The indexing mechanism is completely interlocked with the press ram action so that only one phase of operation can occur at any one time. The large 16" diameter work circle provides ample tool room as well as operator room. Ejector mechanisms or other auxiliary tools can be mounted directly to the housing. The hollow dial spindle permits the installation of air, water, gas, or electric lines through the housing to above the dial. Dial and spindle are sealed from the indexing mechanism so that liquids may be flooded over dial without damage to the indexing drive. Feature for feature—compare this H-P-M Index Table with any other on the market—it's the best!



. the new Versatile H-P-M C PRESS!

CHOICE OF OPERATING CONTROLS

Manual Valve

This is the basic type hydraulic control valve. It is a spool-type 4-way valve designed specifically for press use. Mounted directly on the cylinder, it can be actuated by either dual levers, single lever, foot pedal or electrical control.

Manual -Servo Valve

This servo valve is a 4-way, spool type valve with an integral feed-back mechanism to effect servo operation and a differential circuit which equalizes ram closing and return speeds. Can be actuated by either single lever or foot pedal.

Automatic Valve

This compound valve is an automatic auto-cycling valve for use with manual controls, incorporating pressure reversal, stroke length reversal and inching control. Various manual or electrical controls are available for use with this valve.

Automatic Valve with Index Table

This valve is similar to the AM valve, above, with the added feature of provision for driving and interlocking the index table. Various manual or electrical controls are available for use with this valve.

The outstanding features of these new H-P-M C-Presses provide them with versatility not found in ordinary hydraulic presses. They are designed as basic automation units. Properly tooled, they may be used for special purpose, high speed applications—or, using interchangeable tools, they may be readily converted to general purpose jobs.

Over 80 years of specialized experience and engineering in the field of hydraulics have gone into their manufacture. Simplification of control, operation and maintenance has been the determining factor in their design. Precision and quality are inherent in their workmanship.

An H-P-M engineer's experience in the application of hydraulics can be of real help to you in the selection of the proper C-Press for your particular application. He is as near as your telephone. Call him today.

HPM

HYDRAULIC PRESS MFG. COMPANY

A DIVISION OF KOEHRING COMPANY
MOUNT GILEAD, OHIO, U. S. A.

I'm interested—please send complete catalog information on the new H-P-M C-Press Line. My primary interest is in—

☐ Manual Presses ☐ Automatic Presses ☐ Automatic Index Table Presses ☐ Tonnage ☐ Have salesman call as soon as possible.

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H830

metals ... ...to match man's imagination

Conventional metals can no longer provide the solution to design, construction and performance problems confronting the aviation and missile industries, among others. That's why metallurgists and technicians in Wallingford's all-new laboratories are constantly researching metals that will keep pace with the imaginativeness of designers and engineers.

Now, Wallingford can deliver, *from available stock*, many of these stainless steels and super metals with special characteristics and properties:

SUPER ALLOYS

A 286 AM 350 AM 355
M 252 N 155 R 235 V 36
Rene 41 Zirconium (vacuum annealed)
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FACILITIES FOR WIDTHS UP TO 27" — THICKNESSES DOWN TO .001 — EXTREMELY CLOSE TOLERANCES MAINTAINED.

Whatever your requirements, Wallingford can help you. Write to The Wallingford Steel Co., Wallingford, Conn.

THE WALLINGFORD STEEL CO.

Progress in Metals for over 36 Years

WALLINGFORD, CONN., U.S.A.

COLD ROLLED STRIP: Super Metals, Stainless, Alloy
WELDED TUBES AND PIPE: Super Metals, Stainless, Alloy

(*Concluded from Page 85*)

ager of the IBM division, is joining the Simplex firm as vice president in charge of sales.

Refractory Maker Builds

Refractories Div., H. K. Porter Company Inc., will open a warehouse at 4452 W. Fifth Ave., Chicago, Ill. Facilities at the division's Ottawa (Ill.) Works have been enlarged.

Dyson Broadens Holdings

Dyson Corp., New York, acquired from Oliver Corp., Chicago, an "important" holding of common stock in Waukesha Motor Co., Waukesha, Wis., manufacturer of gas and diesel engines.

Milwaukee Firms Unite

Outboard Marine Corp., Milwaukee, has purchased about 95 per cent of the common stock of Midland Co., South Milwaukee, Wis., and will operate it as a subsidiary. Midland, a manufacturer of power garden and lawn equipment, stopped production about Sept. 1.

Wittek Enlarges Plant

Wittek Mfg. Co., Chicago, is erecting an addition to its plant to provide more space for the production of automotive and industrial hose clamps.

Dudley Steel Builds

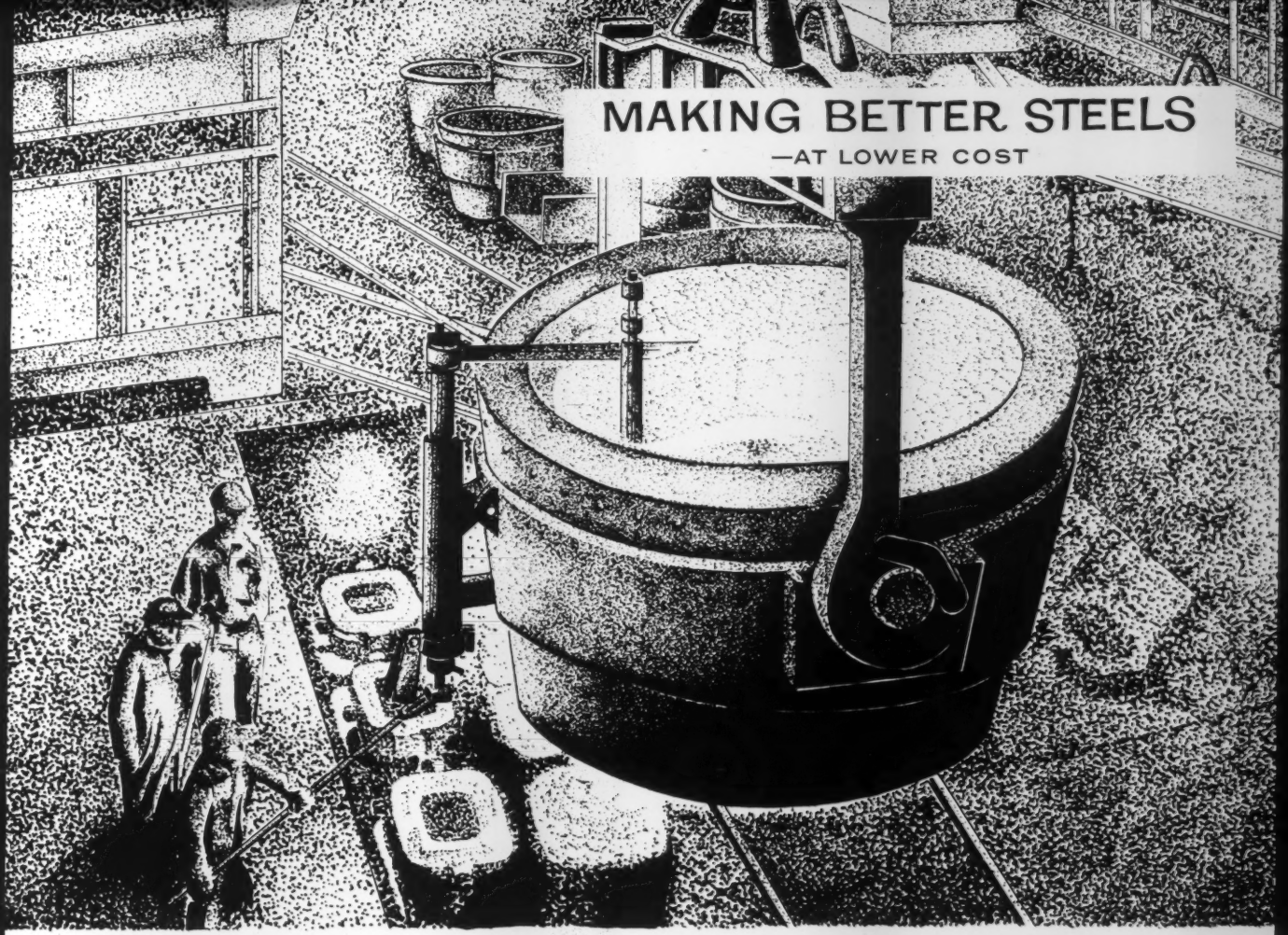
Dudley Steel Co., Los Angeles, completed construction of a 5000 sq ft manufacturing facility at 1405 Bomarwin Ave., Downey, Calif.

Offers Metal Laminates

Columbus Coated Fabrics Corp., Columbus, Ohio, organized a Vinyl Metal Products Div. The division will merchandise a special vinyl plastic sheeting for lamination to all types of metals. E. L. Mahoney is director of sales of the new division.

Forms Importing Firm

Materials for Electronics Inc. has been organized to supply special purpose chemicals, metals, ceramics,



TEEMING

. . . top quality steel from ladle to ingot climaxes another job well done by melters who know every trick of their trade.

Experienced melters have also discovered that **GLC GRAPHITE ELECTRODES** with **"weld-strength" Unitrode**® nipples help make better steels at lower cost.

FREE—*This illustration of one of the skills employed by the men who make the metals has been handsomely reproduced with no advertising text. We will be pleased to send you one of these reproductions with our compliments. Simply write to Dept. S-11.*

ELECTRODE GLC® DIVISION

GREAT LAKES CARBON CORPORATION

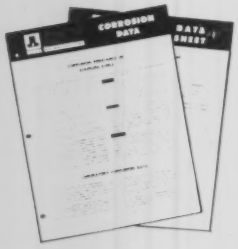
18 EAST 48TH STREET, NEW YORK 17, N.Y. OFFICES IN PRINCIPAL CITIES

New Sendzimir Mill

produces stainless steel sheets to extremely close tolerances in widths up to 48 inches

This new Sendzimir mill, complete with annealing, pickling, skin pass and other equipment, was designed and engineered for the exclusive production of the highest quality stainless sheet and strip.

It is located at the Louisville, O., plant of J & L's Stainless and Strip Division. For complete information on the Division's flat rolled stainless products, write our Detroit sales office today.



Write for these Technical Data:
1. Laboratory Corrosion Data.
2. Data Sheets (please specify the grades in which you are interested).

Improve your Products with . . .
JL STAINLESS STEEL
BAR • WIRE • SHEET • STRIP

Jones & Laughlin Steel Corporation • STAINLESS and STRIP DIVISION • Box 4606, Detroit 34

minerals, and components to the electronics industry. Headquarters are at the Continental Hotel, Jamaica 34, N. Y. Products will be imported from Belgium, Brazil, France, Germany, Great Britain, and Italy. M. J. Rafale is president.

ASSOCIATIONS

American Institute of Steel Construction Inc., New York, elected these officers: President, H. Buckley Dietrich, Dietrich Bros. Inc., Baltimore; first vice president, James M. Straub, Fort Pitt Bridge Works, Pittsburgh; second vice president, H. G. Lewis, Flint Steel Corp., Tulsa, Okla. L. A. Post was re-elected executive vice president and assistant treasurer; E. P. Stupp, Stupp Bros. Bridge & Iron Co., St. Louis, treasurer; and M. H. Smedley, secretary and general counsel.

Hans J. Heine has been named technical director for the **Malleable Founders Society**, Cleveland. He will co-ordinate and supervise research and technical activities of the society.

Solid Carbide Tool Institute, Philadelphia, has been reorganized. The new organization will provide standards on solid carbide tools for the industry and will develop and publish statistical information for its members. The new president is H. W. Fichtner, Atrax Co., Newington, Conn. The Walter Gebhart Organization will serve in the capacity of executive secretary-treasurer.

An Information Center has been established by the **American Welding Society**, 33 W. 39th St., New York, N. Y. Fred L. Plummer is national secretary of the society.

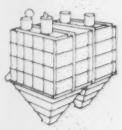
Conveyor Equipment Manufacturers Association, Washington, elected these officers: President, J. B. Nordholt Jr., Webster Mfg. Inc., Tiffin, Ohio; vice president, E. H. Woodberry, Lamson Corp., Syracuse, N. Y.; treasurer, L. J. Johnson, Mathews Conveyer Co., Ellwood City, Pa.; and secretary, E. E. Saperston, Mechanical Handling Systems Inc.,

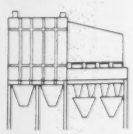
(*Please turn to Page* 94)

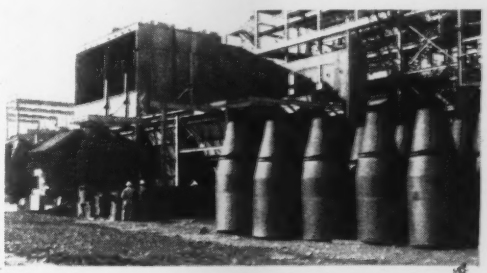
The most efficient operating cyclone collectors made

Design makes the difference: in over a thousand plants across the continent, Buell Cyclones have *proved* themselves more efficient than any other cyclones made. Buell's exclusive Shave-off port (A), traps the extra percentage of dust that ordinary cyclones lose. And large-diameter (B), custom-engineered design eliminates bridging, clogging, or plugging during operation, keeps efficiency high without interruption. Regardless of your present or planned plant layout, Buell equipment can be designed to solve your dust collection problems efficiently and economically. There's valuable information in a concise booklet, "The Exclusive Buell Cyclone". Write Dept. 26-J, Buell Engineering Company, Inc., 123 William Street, New York 38, N. Y.

BUELL CYCLONES


"SF" ELECTRIC PRECIPITATORS


PRECIPITATOR-CYCLONE COMBINATIONS


Buell Cyclones before installation at a major plant.

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Experts at delivering Extra Efficiency in

DUST COLLECTION SYSTEMS

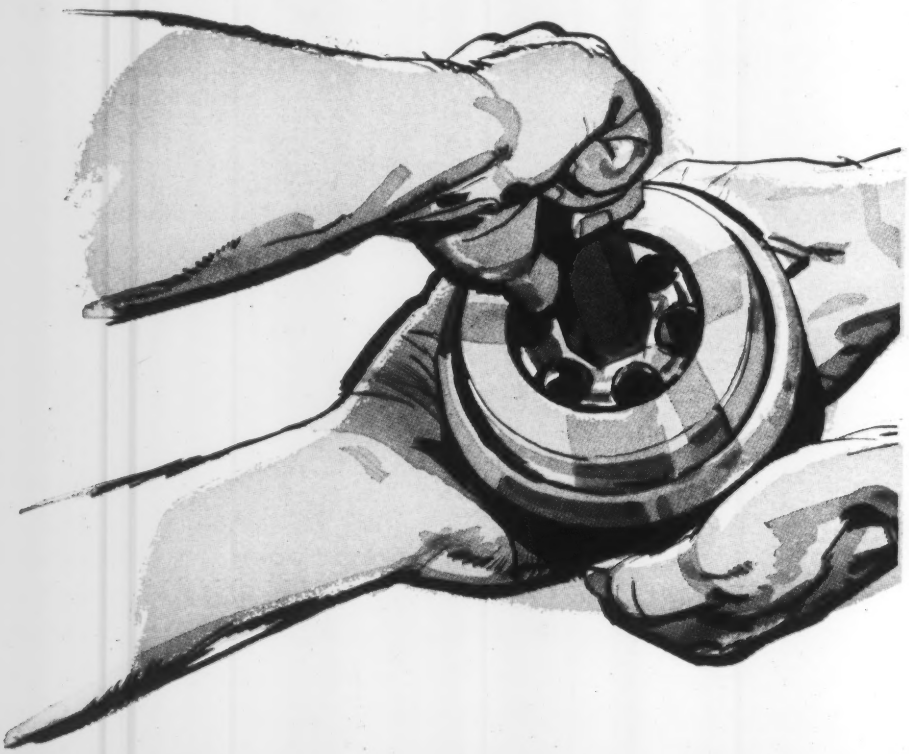
Look what

production increases

this company got with

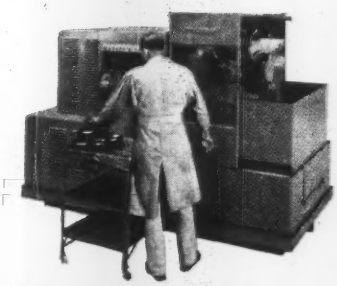
STANICOOL
HD Soluble Oil

PRODUCTION MANUFACTURING COMPANY DOUBLED NUMBER OF THREADS CUT BETWEEN CUTTER SHARPENINGS, SCORED OTHER PRODUCTION GAINS



Situation: O. C. Patterson, vice president of Production Manufacturing Company, Tulsa, wanted to cut down on the number of metalworking products used in the plant. He wanted to use just one oil for cutting SAE 1025 steel, screw stock and SAE 440 stainless steel.

Action taken: Checking with Standard Oil lubrication specialist, R. J. MacMurray, Mr. Patterson learned about STANICOOL HD Soluble Oil. A test was set up on a Warner & Swasey automatic bar machine. Roger MacMurray helped set up equipment for the test and helped work out the right STANICOOL HD and water mixtures for the types of metal used. A 4:1 mix for 1025 steel, and up to 10:1 for other metals and jobs was decided upon.



What happened: Parts were threaded on the bar machine that Production Manufacturing had previously been unable to thread. On a new Warner & Swasey AC chucker, it was found STANICOOL made possible threading at a speed of 35 surface feet per minute. With STANICOOL HD 150 threads could be cut before the cutter needs to be sharpened. Only 75 threads could be cut before. Plant management found STANICOOL also protected work from rust while it went through many additional shop operations.

To find out more: All the facts about STANICOOL HD Soluble Oil are yours. Just call your nearby Standard Oil lubrication specialist in any of the 15 Midwest and Rocky Mountain states. Or write **Standard Oil Company (Indiana), 910 S. Michigan Ave., Chicago 80, Illinois.**

No trouble. Pressure coupling is checked by O. C. Patterson, vice president of Production Manufacturing, Standard Oil's Roger MacMurray and foreman Byron Finley. Roger MacMurray helped the men in this plant find a new route to production increases with STANICOOL HD Soluble Oil. That's his job, and he's well equipped for it. Eight years' experience in such work, an engineering degree from the University of Colorado and completion of the Standard Oil Sales Engineering School are his qualifications.

Quick facts about

STANICOOL HD Soluble Oil

- Has E. P. and oiliness properties comparable to cutting oil.
- Contains germicide that controls bacteria build-up.
- Is nonirritating to skin.
- Protects machines, tools and work against rust and gumming.
- Will not gel in cold weather, has excellent emulsion stability.

You expect more from STANDARD and get it!

DURALOY

25-20 Casting with Welded Assembly

This is a separator destined for a reaction process. It is typical of the kind of work we do in the high alloy casting field. In the 25 Cr-20 Ni range it is alloyed to withstand both corrosion and heat. Assembled, its weight runs some 2000 pounds. It was inspected and tested under very rigid ASME Code requirements.

The production of chrome iron and chrome nickel castings has been our sole business since 1922. We added centrifugal castings to our service in 1933 and shell molded castings in 1955. Our metallurgists have extensive knowledge of the many operations requiring high temperature and corrosion resistant castings. Perhaps this experience would be helpful to you if you are confronted with a specific problem and wish to determine the best alloying combination for your required castings. We can be helpful, too, in designing the unit, contributing our knowledge of strength and stresses in castings.

The DURALOY Company

OFFICE AND PLANT: Scottdale, Pa.

EASTERN OFFICE: 12 East 41st Street, New York 17, N. Y.
ATLANTA OFFICE: 76—4th Street, N.W.
CHICAGO OFFICE: 332 South Michigan Avenue
DETROIT OFFICE: 23906 Woodward Avenue, Pleasant Ridge, Mich.

(*Concluded from Page 91*)

Detroit. R. C. Sollenberger was re-elected executive vice president.

Ernest E. Michaels, Chicago Bridge & Iron Co., Chicago, was elected chairman of the **Welding Research Council** of the **Engineering Foundation**, New York.

NEW OFFICES

Allen Steel Co., Salt Lake City, Utah, opened a branch office at 1818 S. Industrial Rd., Las Vegas, Nev., under the management of R. N. Carmer.

Dana Corp., Toledo, Ohio, moved part of its Pottstown (Pa.) Div. staff into a new $200,000 building. Departments involved: Production control, purchasing, plant engineering, quality control, time study, cost control, estimating, tool engineering, and tool designing.

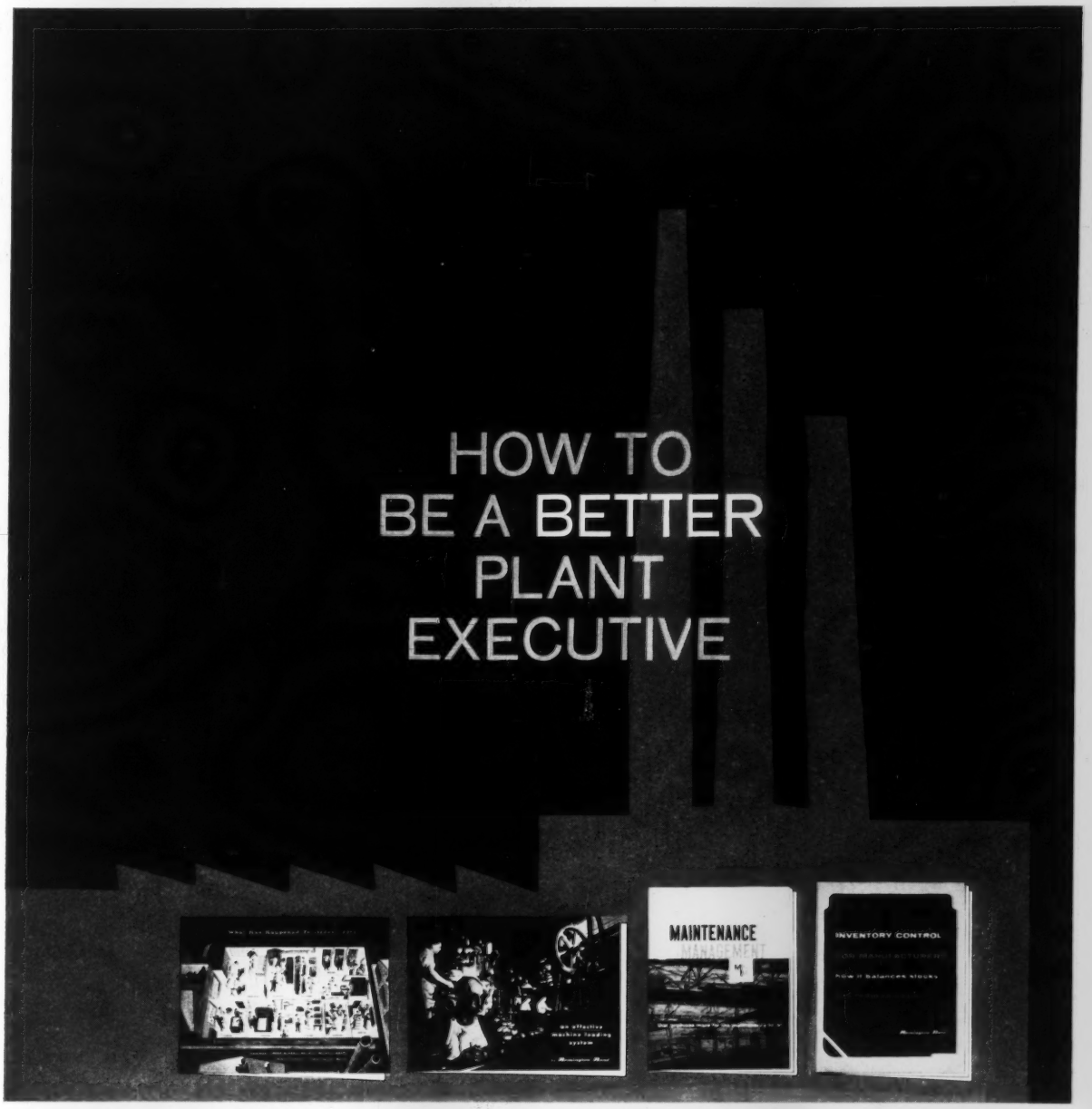
CONSOLIDATIONS

Pittsburgh Plate Glass Co., Pittsburgh, has acquired the assets of **Barium Reduction Corp.**, South Charleston, W. Va. The Pittsburgh firm's subsidiary, Columbia-Southern Chemical Corp., will manage and operate this facility for the parent company.

James Mfg. Co., Ft. Atkinson, Wis., sold the bulk of its property and assets to **Rockwood & Co.**, Brooklyn, N. Y.

Marquardt Aircraft Co., Van Nuys, Calif., is acquiring Cooper Development Corp., Monrovia, Calif., manufacturer of support equipment for air and space research programs. C. D. Cooper will continue as president.

Republic-Odin Appliance Corp., Los Angeles, acquired **Fowler Mfg. Co.**, Portland, Oreg., manufacturer of gas and electric appliances, and will operate it as a subsidiary. Fred Fowler is president of Republic-Odin's Fowler Div.; Archie Schwieso, vice president and plant manager.



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Good plant executives know how to maintain *positive control* over these important manufacturing functions.

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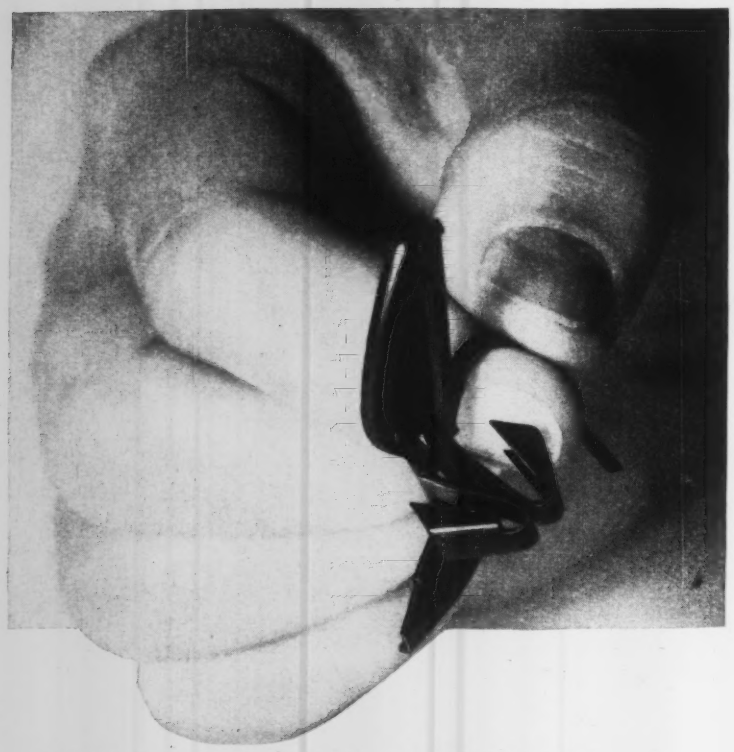
Company_____
Address_____
City_____ Zone___ State_____



NILSON 4-SLIDE TAKES A TOUGH ONE . . .

Mass production of body trim clips for a leading make automobile proved a complex forming problem. A. H. Nilson's 4-Slide (Model S-4-T) did the job, forming .025" x 3", 1065 C.R.A. steel at 54 strokes per minute! Accurate, fast, and automatic, Nilson 4-Slides keep pace with one of the nation's biggest industries.

THIS ONE WAS EASY . . .

A Nilson 4-Slide, Number 1, forms 150 drapery hooks per minute from 0.70 basic steel wire. Nilson 4-Slides form wire or ribbon stock from the coil. They straighten, feed, pierce, blank, swage, stamp or coin, cut and form in one, fast, automatic operation . . . accommodate wire up to .5" dia., in feeds to 32" max., and ribbon up to 3.5" wide. Press sections from 5 to 75 tons.

A. H. Nilson provides forming recommendations from detailed information without obligation. Send for catalog.

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Automatic Chain Making Machines : Staple Forming Machines
Wire and Stock Reels : Wire Straightening Equipment : Slide Feeds for Presses

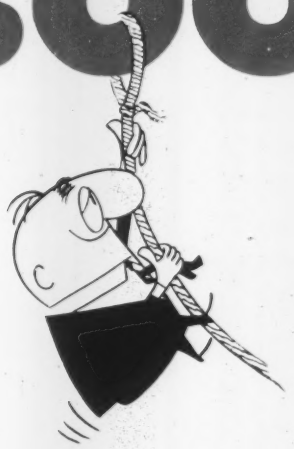
Program for Management in 1959

The article beginning on the opposite page concludes our Program for Management—1958. STEEL's 1959 series will be introduced in the annual issue, Jan. 5. A ten-part series will follow, beginning in a February issue. The theme of next year's program will be: Metalworking managers' changing role in our economy. The 1958 articles are:

1. **Balancing Management for Profit (Feb. 17, p. 113)**
2. **Production Control for Profits (Mar. 17, p. 83)**
3. **Managing Defensework for Profit (Apr. 14, p. 125)**
4. **Building a Labor Contract (May 19, p. 125)**
5. **Pricing for Profit (June 16, p. 87)**
6. **Finding Out What Customers Will Buy (July 14, p. 101)**
7. **Surveying the Market (Aug. 18, p. 85)**
8. **Building Marketing Men (Sept. 22, p. 69)**
9. **Purchasing for Profit (Oct. 13, p. 89)**
10. **Get Ready for the New Boom (Nov. 17, p. 97)**

Extra personal copies of these Program for Management articles are available until the supply is exhausted. Write: Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

GET READY FOR THE NEW BOOM



IF A GENIE popped out of your desk drawer and guaranteed you a sales increase of 15 per cent between now and 1965—no more, no less—would you settle for it?

You'd be shortchanging your company if you did.

The economy will be well into a new boom that promises to make the dynamic postwar period look slow.

By 1965, your basic marketing information will read like this:

Population, 190 million, up 10 per cent since 1957.

Personal income, $450 billion, up 20 per cent since 1957.

Gross national product, $590 billion, up 35 per cent since 1957.

The increase in gross national product is particularly impressive when you consider that it will be on top of a 50 per cent gain (1950-57). But that's only the beginning.

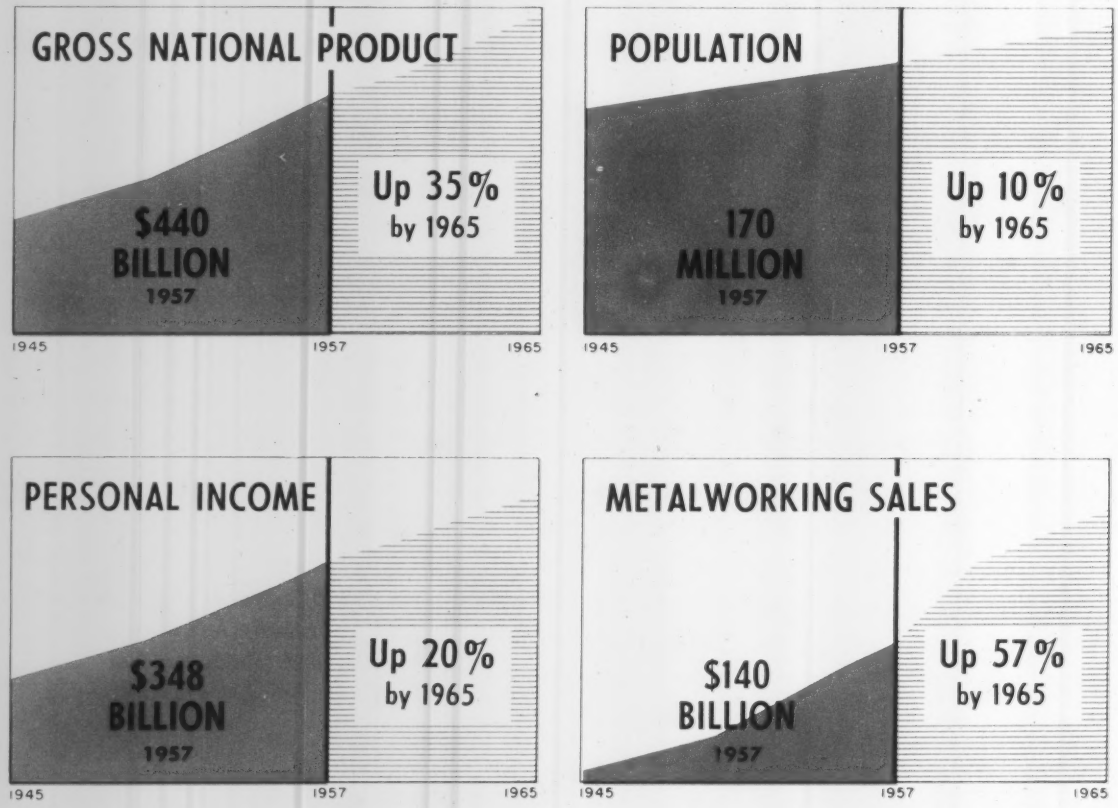
Look for metalworking sales to reach $220 billion (57 per cent above the 1957 figure) by 1965.

Blue sky?

Judge for yourself: Per capita consumption of metal products has advanced at a rate of $41 annually since World War II. You come up with a 40 per cent increase in 1965 sales ($196 billion) if you chop the per capita rate to $20. Certainly,

For measuring your own progress . . .

Basic Economic Indicators Provide Good Growth Guideposts



Money projections in terms of 1957 dollars.

57 per cent is still something of a compromise.

Even if your forward thinking is tempered by your recession experiences, you can't escape this conclusion: Your company could really go places in the sixties—and you can do a lot toward changing "could" to "will" with one simple move: Start preparing for the new boom now.

Competitive Weather—Hot

Sales and growth came easily in the postwar years because of pent-up demands for industrial and consumer goods. Capacity didn't catch up until 1955. Now the pendulum is swinging in the other direction, a factor which will intensify competition in the sixties.

It means the race will go to those who start their planning now, so they can anticipate their product, financial, facility, and management needs.

The task calls for formal, long range planning.

True, the approach is conventional, but count yourself among the minority if you're using it. STEEL found that only the industrial giants (such as the auto, steel,

and appliance makers) and an occasional smaller manufacturer are taking advantage of this valuable tool. The "explanations" run like this:

"We can't afford elaborate economic departments like the GEs and GMs."

"We make only components and industrial products. You can't project those sales like you can consumer products."

"We're not big enough. We keep pace with our industry, and that's the best we can expect."

Here are the facts:

Long range planning is not expensive. A wealth of statistics is available at nominal cost if you know where to get them. Combine that information with good company sales records and you have the bases for good projections.

Industrial sales are difficult to project over the long pull, but you have two advantages over the producer of consumer items: It's easier for you to project such things as profit margins because the life cycles of your products are longer; and your marketing risks are generally smaller.

Here's Why It's Needed

Mark W. Cresap Jr., Westinghouse Electric Corp.'s president, outlines five reasons for long range planning—and they're as applicable to the small and medium firms as they are to the giants:

1. To raise the sights of an organization.

2. To provide that organization with the stimulating effect of concrete goals.

3. To assure a team effort toward uniform objectives.

4. To provide the necessary lead-time for the achievement of objectives.

5. To furnish a basis for annual budgeting in a more purposeful manner than references to historical performance or static standards.

The first step in adopting a long range planning program is to develop a philosophy of growth so that you can set objectives. Are you satisfied to merely increase sales each year? Is keeping pace with your industry enough?

Most executives prefer one of the basic economic indicators, such as gross national product, metalworking sales, or personal income, as a bench mark. Reason: Some industry trends, while not declining, are not keeping pace with the national economy.

Although a company may compare well with its competitors, it faces the prospect of losing its status in the industrial world.

Perhaps some other factor, such as geographic location, may provide an ingredient for your growth philosophy. Example: Because of the expected impact of the St. Lawrence Seaway and Chicago area's rapid growth, Inland Steel Co. is projecting an expansion rate faster than that of the steel industry generally. Joseph L. Block, president, says Inland's capacity will rise from its present 5.6 million ingot tons to

How To Plan for the Long Term

1. Develop your growth philosophy, establish objectives in terms of . . .

- Type and character of business.
- Emphasis on product mix or services.
- Price niche to fill.
- Dollar volume and share of market.
- Profit margin, return on investment.

2. Determine policies which will govern your growth in terms of . . .

- Quality and pricing.
- Distribution.
- Make or buy decisions for materials and components.
- Labor relations, public relations.
- Finances.

3. Outline a program to achieve the objectives in terms of . . .

- Organizational and personnel requirements.
- Physical facilities.
- Research and development emphasis.
- Material supply.
- Distribution organization.
- Financial requirements, how to meet them.

4. Set up a monitoring system . . .

- Use semiannual or annual reviews to evaluate progress and permit formulation of corrective action.

Where Opportunity Knocks . . .

The charting of your company's future starts with the identification of industries and products that offer growth opportunities, says L. S. Drake, economist for Calumet & Hecla Inc.

Dr. Drake has initiated an industrial economic analysis program which uses the Commerce Department's Standard Industrial Classification statistics as a base. Its major phases include:

1. Describe and forecast the activity of each major industry group (SIC, two digit classifications), emphasizing those of potential interest. (The chart below is an example of one segment of this phase.) This phase develops a basic frame of reference from which to work.

2. Break down attractive major groups into specific industries (SIC, four digit classifications) with a description and forecast of those indicating greatest growth opportunities.

3. Review and analyze the less promising major groups which may be of interest but were omitted in the first examination.

4. Identify, describe, and forecast the prospects of products and product groups showing greatest potential growth and stability.

Dollar sales volume and value added by manufacture—statistics available from the Commerce Department—are only part of the picture, emphasizes Dr. Drake. Equally important are production and financial information regarding income, assets, liabilities, and operating ratios. Such information can be secured from sources like the Federal Reserve Board indexes, Federal Trade Commission, Securities & Exchange Commission, consulting firms, business and trade magazines, industry associations.

Examples of Projections of Major Industry Groups

Physical Production Indexes (1947-49 = 100)

SIC No.	Group	1955	1956	1957	1958	Trend Value 1958*	1968
36	Electrical Machinery, Equip., Supplies	194	207	204	185	207	400
28	Chemicals & Allied Products	167	177	184	181	185	333
38	Instruments, Related Products	149	166	172	158	176	334
26	Paper, Allied Prod.	152	159	158	152	163	253
32	Stone, Clay, Glass Products	149	158	155	140	159	240
37	Transp. Equip.	203	199	213	160	201	301

*The 1958 trend value is determined by adding 5% to the 1955-58 average.

7 million in 1962, 8 million in 1967, 11.5 million by 1977.

How It Operates

The second step is to pinpoint responsibility for long range planning. Most executives feel that it is a line responsibility in which the action should be upward. Co-ordination of the program is generally a staff activity.

At Inland Steel, planning is the responsibility of division managers. To maintain company-wide continuity, division programs are co-ordinated by L. B. Hunter, assistant to the president. Under him, the commercial research department develops product and industry projections for use by division heads. Decisions involving major expansion programs and new product planning are made by a product and facilities committee. Members include President Block, Mr. Hunter, and top sales, financial, manufacturing, and operating executives.

The foundation of long range planning is the sales forecast. It provides the basis for projecting facility requirements, changes in marketing approach and organizational structure, manpower requirements, financial needs, research and development emphasis.

Chain Belt Co., Milwaukee, groups its product lines into ten divisions. Each operates as an individual unit and operates its own business to the greatest possible extent.

To assist division managers in making their forecasts to set goals, Chain Belt established a commercial development department. It is a three-man group, with the manager reporting to the president. Its principal functions are economic research, market research, new product investigation, and co-ordination of the firm's long range planning.

Under the direction of Arthur J. Frank, the commercial development department works up a five-year basic economic forecast for the division managers. Since Chain Belt is in the capital goods business, the report places emphasis on the Federal Reserve Board's industrial production index, plant and equipment expenditures, and construction indexes.

Steps to the Forecast

Using the forecast as a guide, division managers develop their five-year projections. The technique follows this procedure:

1. Division activities are broken down by product lines. They range from three in one division to 14 in another. The company as a whole identifies and establishes forecasts on 56 product lines.

2. Officials examine each product line from the standpoint of principal end-use markets, relating sales trends with market trends.

3. The impact of possible technological changes in end-use markets is considered. For example, Chain Belt must be alert to the emphasis on prestressed concrete. The company produces equipment for concrete production. The switch from on-site pouring to precasting at a central location may affect its products and markets.

4. The division's share of the market is considered. Questions include: What are the trend lines and what is the competitive situation? Which developments may affect its share of the market?

Fact Finding

Don't let the multitude of statistics throw you. The sources of good material fall into these categories: 1. The government, with the Commerce Department heading the list. 2. Trade associations. (Metalworking has more than 450. Many do an excellent job of keeping sales figures and indexes.) 3. Business magazines like STEEL, which keeps tabs on 24 major metalworking industry and product activities. (For a more comprehensive report on the techniques of fact finding, see STEEL, Aug. 18, p. 85.)

The important thing is to develop indicators which have a correlation with your product and industry sales. Don't try to get complicated —there's bound to be a margin of error. You're looking for the trend lines, not the details.

Harold Heineke, Allis-Chalmers Mfg. Co.'s commercial research manager, cites some examples. His firm's sales curve for distribution transformers closely parallels housing starts. Equipment sales to the cement industry closely follow trends in construction and gross national product.

Company annual reports are an often overlooked outside source of information. Check those in your industry and end-use markets for tips about expansion plans, forthcoming technological developments, research and development emphasis, and long range projections.

The Pros Can Help

If you feel you're too small to afford the staff to develop the information and projections you require, a reputable economic consulting firm can be a good right arm. Ceco Steel Products Corp., Chicago, retains a New York economist to supply it with information on the economy and trend lines. Says Ned A. Ochiltree, president: "I'd make budget cuts in many places before I'd drop this service. We consult with the economists about every six weeks for a review of the segments of the economy which affect our business."

Ceco reviews its short term projection (one year) each quarter and maintains a continuing 12-month projection. It also maintains a five-year projection which it updates and reviews annually.

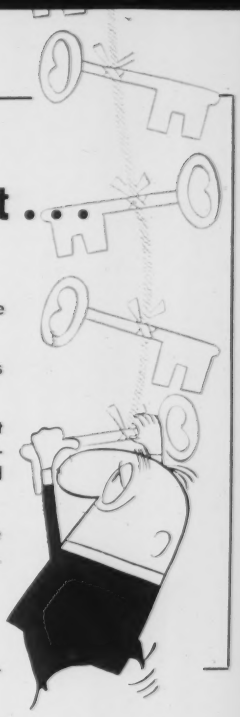
Your company's sales records are important projection tools if they're set up right. Magnaflux Corp., Chicago, has developed an IBM system. Officials can quickly break down orders and sales by industry groups, by product, by customer, by geographic location, and by plant size. The firm also keeps a running sales projection on 20 major industries it serves.

Here's how Magnaflux puts its information to work. "Our sales to electronics markets total about 10 per cent of our volume," explains W. E. Thomas, executive vice president. "But our projections indicate that the electronics industry will take 20 per cent of our volume within the next two or three years —if we have the products available. To be ready with new products, we're spending about 50 per cent of our research and development dollars on electronics applications."

Magnaflux also sees the implications of a possible marketing change: Measuring instruments will have a specialized market, the research laboratory. Officials anticipate setting up an organization of

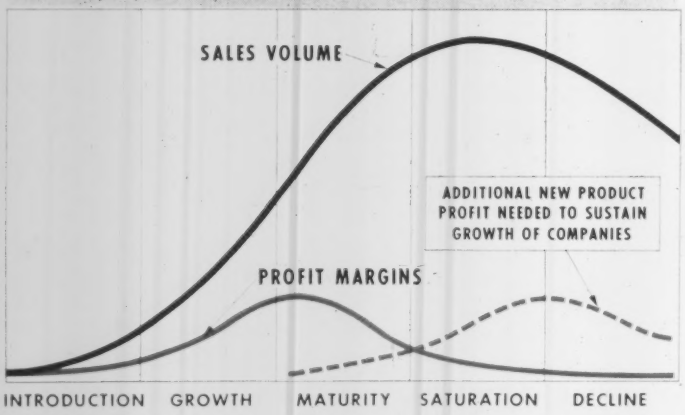
Keys to the Sales Forecast . . .

1. **Break down forecast by major product lines.**
2. **Develop trend lines based on past sales and share of the market.**
3. **Develop trend lines of the major end-use markets you serve.**
4. **Determine important variables which will affect the projection—such as economic indicators, population growth, geographic market shifts, and changes in the competitive situation.**
5. **Evaluate the technological changes that can be expected in your product and competing products. How will they affect your sales and markets?**



New Products: Avenue for Profit Growth

The Basic Life Cycle of New Products



Companies that bring out new products almost always improve their profits. The basic life cycle chart prepared by Booz, Allen & Hamilton, management consultants, shows why.

Profit margins climb rapidly during the introduction, growth, and early maturity stages. They start to descend as competition appears, even though sales continue upward.

independent representatives to handle those products.

It Costs Money To Grow

Facility and financial requirements are developed from the sales forecast. At Chain Belt, the vice president in charge of facilities works with the division managers on plant and equipment needs. If production capacity for tomorrow's sales is to be in place and functioning when the sales are secured, the capacity has to be thought out today, officials stress.

Chain Belt divisional profit and loss projections are incorporated into an over-all company balance sheet projection. It is compared with objectives in profit margins, return on investment, earnings per share, and dividends. Such projections signal future money needs, and the company can plan accordingly.

Profit margins are getting increasing attention from planning managers. Metalworking has watched its profit margins shrink in the postwar era. Expanding sales numbed any sense of urgency, but the recession cured that.

You have three major approaches to profit improvement: Increase sales, cut costs, improve products and develop new ones. In each, long range projections can help you identify the best direction to take and help you plot your strategy.

With the threat of intense competition in the early 1960s, alert planners are drawing up modernization programs now to insure lowest possible costs. With nearly half of metalworking's machine tools over ten years old, the cost cutting potential is tremendous.

Look at Profits

Profit margins are a key factor to consider when you're investigating diversification opportunities, emphasizes L. S. Drake, economist at Calumet & Hecla Inc. See Page 100 for an outline of his approach to identifying areas of growth opportunity.

The rate of expansion in a market is not necessarily a measure of its profitability. Product life cycles play an important role, particularly in consumer products. Industrial products usually have a longer life cycle.

The importance of life cycles is illustrated by the above graph. (Booz, Allen & Hamilton developed it.) The most profitable periods in a product's life are: The introduction, growth, and early maturity stages. Television's introduction period began about 1948, and profitability followed sales curves upward. Some TV producers were netting up to 20 per cent in 1950 when the profitability curve peaked. The honeymoon was nearly over. Even though sales continued upward sharply, profits fell as more companies got into the act and competition became keener. By the time price cutting had run its course, profits dropped to 2 per cent and lower for those firms which survived the shakeout. Today, profits are moving up toward more normal levels.

The life cycle of industrial products is generally longer and doesn't

pose such a problem. But that advantage is offset by another consideration: The cost of entering a new industrial field. You have to wrestle with puzzlers like these: How much of a capital expenditure is needed for production? What's the competitive pattern? Are your distribution facilities adequate, or will you have to establish a costly new system?

When you get those answers, a complicating factor stands in the way: The lower the cost of entry, the more competition you can expect.

Your Greatest Asset

One of the prize payoffs of formal planning is that it will force you to think in terms of your company's greatest asset—your managers. Do you have a successor for each top management post? How far down the management ladder can you pinpoint succession? Say your firm grows 35 per cent in the next five years, and your organizational structure undergoes evolution. Will you be able to fill each new post with a qualified executive who is in the company?

International Business Machines Corp. projected its management requirements in 1956 and discovered it would not have enough top executives over the succeeding five-year period, so it launched programs (see at right) that reached three levels of managers. T. E. Clemmons, director of executive development, offers these observations:

- It is possible to train a large number of executives within a relatively short time.
- It is possible to expose your executives to some of the nation's best educational talent. IBM brings in authorities to teach about one-third of the course. They include men from Harvard, Yale, Columbia, Cornell, MIT, and other eastern schools.
- It's not cheap. Say you're training 12 executives at a time, with each earning an average of $2000 monthly. It means you're starting with a $24,000 base. Add living expenses, travel, permanent staff costs, and outside guests, and you're talking $50,000 per month. But it's still a sound investment. IBM spends 25 times as much on other educational programs.

Lawrence A. Appley, president of the American Management Association, emphasizes the need for long range planning of your executive requirements: "The 1960s will be the golden years for management because that's when the big dividends from the postwar millions spent on development programs will begin to appear. The resurgence of business will be due in large measure to the increased competence of our executives."

Enough Executive Power for Growth?

In 1956, International Business Machines Corp. took a long look at its management structure. The appraisal revealed:

- **Its sales had grown from $50 million annually before World War II to $1 billion.**
- **It was a highly technical organization.**
- **It was strongly sales oriented.**
- **It was in the process of being changed from a centralized to a decentralized operation.**
- **It had hired few men with executive potential during the war, so the billion-dollar company was trying to fill executive positions with men hired to staff a $50-million business.**

"We tabulated all college graduates by division and year of hiring," relates T. E. Clemmons, director of executive development. "Then we plotted a chart indicating years of experience of each group. The studies showed rather clearly that top executives would be in short supply for five years."

Formal education and training were instrumental in developing a strong sales and service organization, but this phase of executive development had been limited.

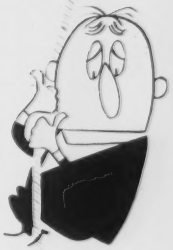
A survey indicated that college programs could not fulfill its needs for advanced formal education.

IBM took these steps in setting up a five-year executive development program:

1. It made arrangements to send 16 of its top 100 executives to college each year.

2. It established its own executive development school to accommodate 100 junior executives per year.

3. It developed an Administrative Training Program for younger men—projections showed that not enough junior executives would be available to fill top level needs. The one-year program combined job experience and formal training. Number of trainees per year: About 30.



Two Keys to Success

We've touched on some of the approaches, elements, and techniques of long range planning. In establishing your program, these two points can mean success or failure:

1. The period covered is important. Most executives checked by STEEL recommend five years. A shorter period may not give you enough time to set up the groundwork and reach your objectives. "Any period over five years may

7 Ways Long Term Planning Can Help You . . .

"Chain Belt Co.'s growth—from $25.8 million in 1945 to over $59.5 million last year—really forced us to adopt some formalized method of long range planning," says O. W. Carpenter, president (above left). Pictured with him is A. J. Frank. He manages the commercial development department, which co-ordinates the program on a company-wide basis.

"We look back now and wonder how we ever got along without it," the officials say. "Here's what it does for us."

1. It serves as a control device for top management to insure that broad thinking and planning conform to the company's business practices and philosophy.

2. It provides a framework within which the chief executive officer can be guided in his thinking and planning.

3. It sets up guideposts for the addition or deletion of products.

4. It encourages top managers to think ahead in terms of personnel requirements, training, and organizational planning.

5. It supplies a background for expense control to insure that long term operations will not be jeopardized by the desire to show improvements in current operations.

6. It stimulates morale of junior managers by outlining company growth patterns.

7. It develops the habit of organized planning at several levels of management.

create serious eyeball strain for those charged with contemplating the crystal ball," says Westinghouse's president.

2. Long range planning must be kept flexible. The purpose is to set up a guide for company direction—it's not a blueprint to be adhered to through hell and high water.

Economic conditions may force you to roll with the business punches—the recession forced many to cut or postpone expansion plans; a fast upturn may necessitate a speedup.

Ceco's Mr. Ochiltree cites this example of the value of flexibility. Plans for the $11-million bar steel mill announced this spring had been formalized for about ten years. Officials knew they had to have it. Three times before, they had worked out the final arithmetic—each time conditions indicated that they had better play a waiting game because money was too tight or expensive; building materials weren't readily available; and mill equipment delivery time was too long.

With the recession, money became easier; construction material shortages eased; and mill equipment deliveries dropped from three years to 18 months. Result: Ceco will build substantially more capacity for its $11 million than the 120,000 tons originally planned. It'll be melting its first steel next May and rolling its first bars in September.

Look at the Big Picture

You'll be the exception if you can map a five-year projection and then follow a timetable to achieve your objectives. Temporary business situations can make us unduly pessimistic or overly optimistic. In such emergencies, long range projections serve as a stabilizer; they encourage rational decisions related to the long term.

Admittedly, this is the most complex and the most uncertain generation businessmen have ever experienced. But just because you can't see across the lake where the ducks are, there is no reason to sit and take only the strays that come over.

Isn't it best to get a guide and go after them?

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NEW KEYSORT TABULATING PUNCH

Today's only machine that automatically code-punches and tabulates original records

The new Keysort Tabulating Punch operates on a unique principle. It code-punches quantities and amounts into the body of your original Keysort cards as a by-product of establishing accounting controls. This same machine then automatically processes these proven records through basic accounting functions to the preparation of necessary management reports.

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At a rental of less than $100 a month, this versatile machine is simple to operate and readily adaptable to centralized or decentralized procedures in companies of all sizes. In many important areas of plant control — job costing; labor distribution; inventory; labor, material and production control; sales and order analysis. In retail customer billing. In service organizations and hospitals — in every type of operation requiring fast, accurate data processing.

Call your nearby Royal McBee Data Processing Representative to arrange for a demonstration, or write Royal McBee Corporation, Data Processing Division, Port Chester, N. Y. for illustrated brochure S-565.

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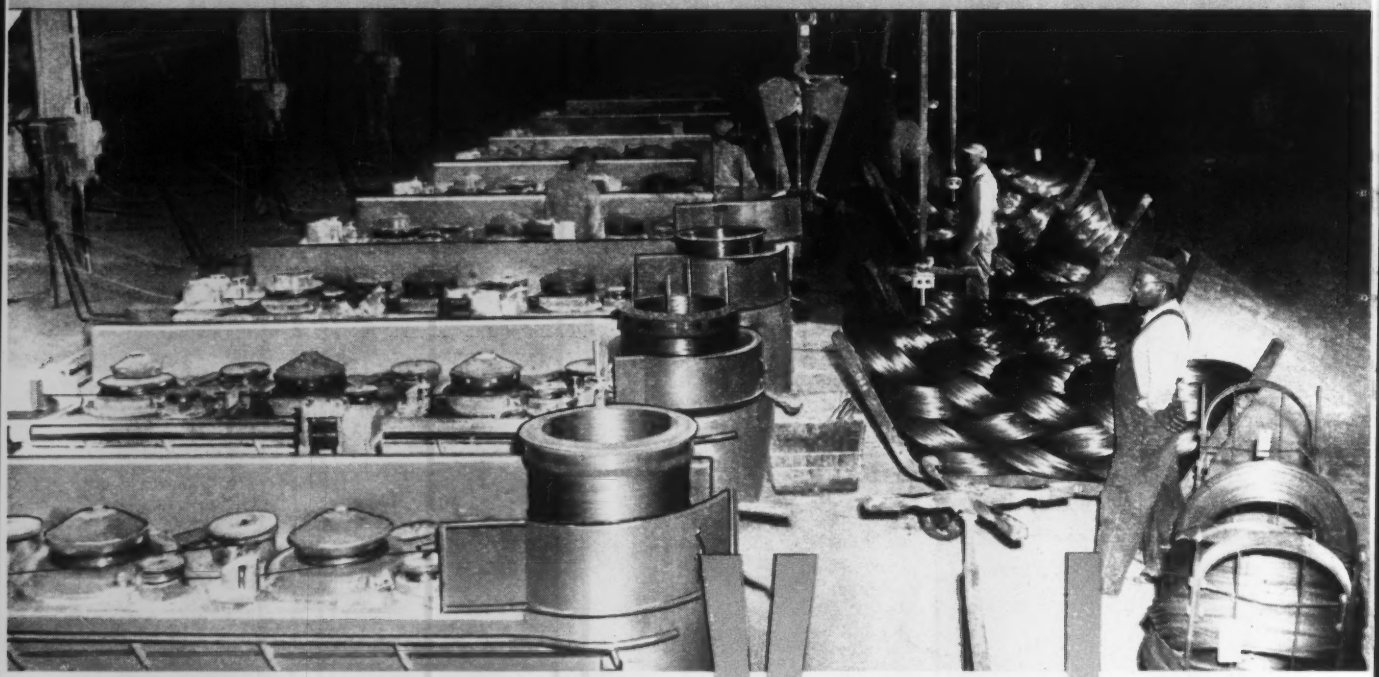
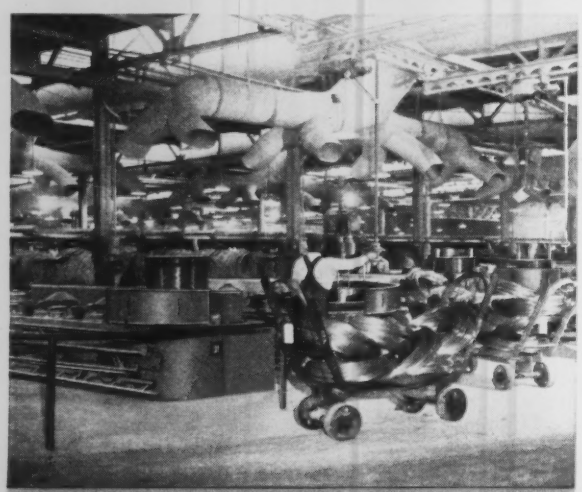
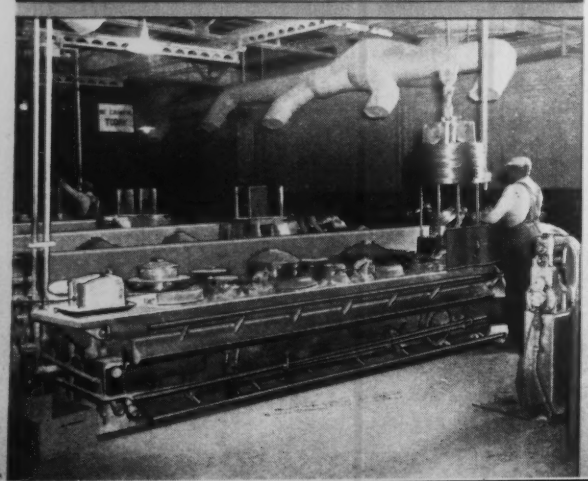
NEW CONCEPTS IN PRACTICAL OFFICE AUTOMATION

...at a large Southern Steel Plant







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STEEL

November 17, 1958

Technical Outlook

HIGH TEMPERATURE PROGRESS—Columbium, says Westinghouse Electric Corp., is better than molybdenum for structural applications in temperatures above 1800° F. At 2000° F, for example, 100 hour creep-rupture strength exceeds that of pure moly. The metal also stays ductile at minus 200° F.

LESS DUST TOMORROW— A wet gas scrubber is undergoing a full-scale test on one of the open hearths at Edgar Thomson Works, Braddock, Pa., U. S. Steel Corp. Local government and steel company officials are encouraged by early results. Hot gases pass through a water film to remove solids, which proceed to a thickener for removal.

SUPERMALLEABLE?— Spher-A-Steel, developed by Albion Malleable Iron Co., Albion, Mich., is reported to have properties strikingly different from those of regular malleables. It overcomes some of conventional malleable's limitations (you can make larger castings, for example) and is expected to find a place in the founder's repertoire. The Michigan firm recently licensed a French auto supplier to use the process.

METALLOGRAPHERS NOTE—The Cobalt Information Center at Battelle Memorial Institute has instruction sheets available on metallographic etching reagents and electropolishing solutions for cobalt alloys.

NOBLE STAINLESS— A Russian scientist has found that small amounts of platinum or palladium make 18-8 stainless steels more resistant to acids. Although expensive, the alloy is theoretically competitive with titanium and other refractory metals for such applications.

CASTING-FORGING ATTRITION—Some government people, seeking ways to replace forgings with castings, have peeked into the possibilities of casting age-hardenable austenitics which have high strength characteristics as forgings. A chrome - nickel - manganese - vanadium, modified from the wrought formula, gives good results at the 100,000 psi level, investigators found. Equally good is a manganese-vanadium with a minimum of alloying elements. You can get the complete report of the investigation from the Department of Commerce, Washington. (Ask for PB 131733.)

STICKS QUICK—You can get fairly high strength with precoated flaps that seal when you press them together. Called pressure-sensitive coatings, they're based on a liquid latex. Coated boxes can be stored flat and assembled without machinery. Coated surfaces stick only to each other, not to untreated areas.

HONEYCOMB SUPERMARKET—Designers and fabricators may soon be able to buy brazed honeycomb panels like lumber. Suppliers, says Solar Aircraft Co., San Diego, Calif., will stock flat sheets, cut them to size on order, form them, finish machine, and even join them to specified edge members.

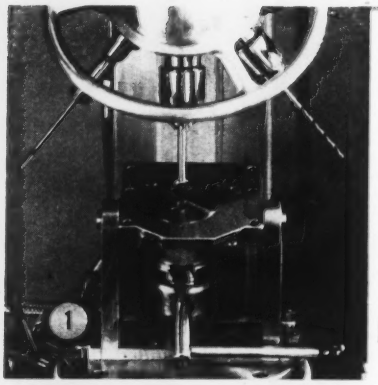
HOT SPIDER WEBS—General Electric says its threads of fused quartz easily take a steady 1800° F and short exposure at 3000° F. The material, designed primarily for rockets and missiles, is an excellent reinforcement for plastics. Other applications include filter cloth and insulation.

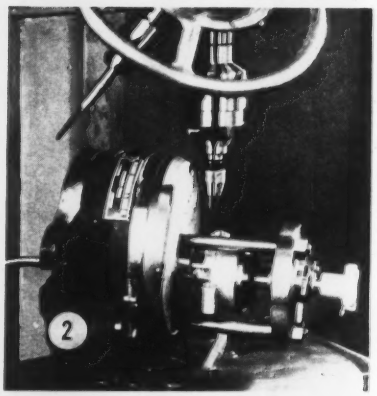
Want Reprints of the Copper Study?

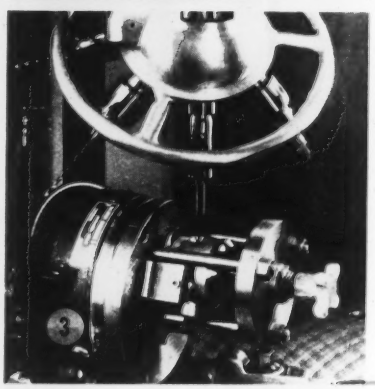
A few reprints of STEEL's special 16-page study, "Copper and Its Alloys" (p. 75, Oct. 27), are still available. If you use copper and copper-base alloys in your products, you'll want a personal copy. The article details trends in production, consumption, application, and fabrication of the key metal. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

How We Beat the Cost Crisis

The Job: Processing Regulator Bodies







'We Got our $16,600 Investment Back the First Year'

New drilling machines helped meet the challenge of mounting costs in a competitive market. It's an example of how aggressive cost cutting pays off. The article is one of the top entries in the Cost Crisis Awards Competition. Another will appear next week

IF YOUR costs get out of line on a bread-and-butter item, you're in trouble.

Air Reduction Sales Co., Union, N. J., had such a problem with an established line of two-stage gas regulators. Costs and competition were the sources of trouble.

H. H. Robinson, assistant general production superintendent, and T. E. Paulsen, superintendent of primary machining, told STEEL: "The insidious rise in the cost of labor, material, and overhead was threatening the regulators' chances of holding a favorable position in a highly competitive market."

Costs had to be pared, but "the job had to be done without sacrificing quality."

• **Target** — Cost investigations showed that a body, common to all regulators in the series, offered the greatest potential for savings. Extensive drilling operations on the free-machining brass forging accounted for most labor costs.

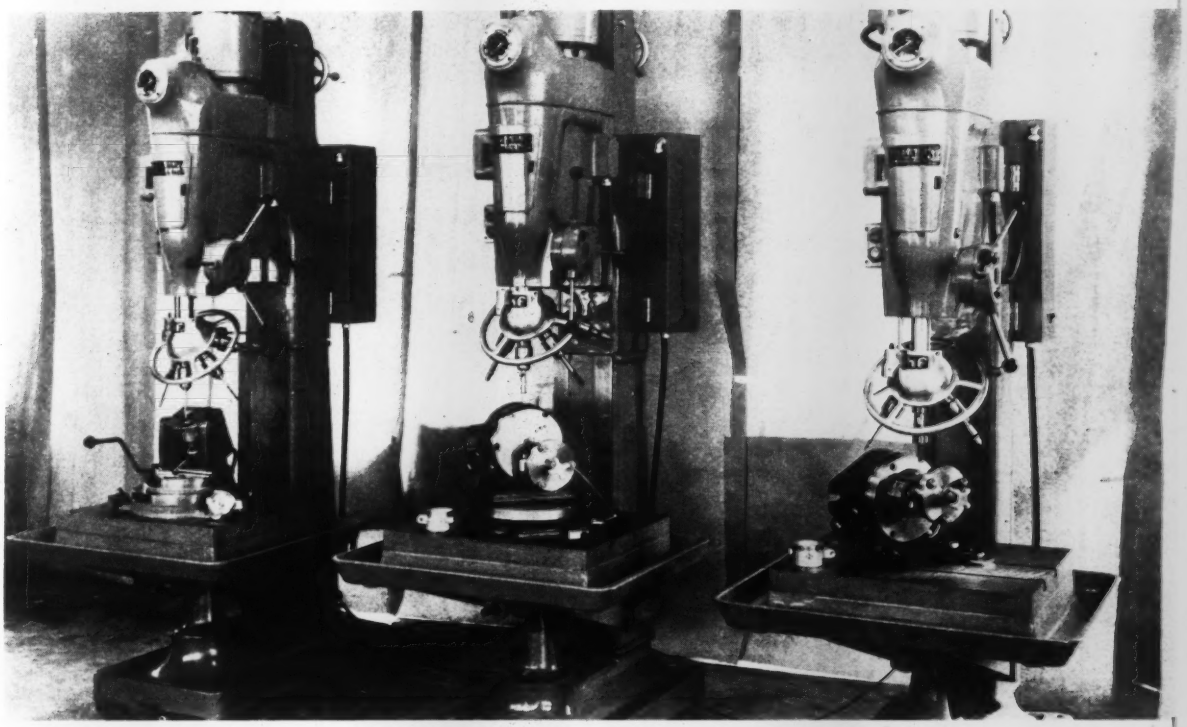
• **Old Way**—Starting as a raw forging, the body called for eight operations. The first three were done on chucking machines. The remaining five were handled on six-spindle drill presses, using box-type drill jigs and angle plates.

The lever ball seat holes are critical (for location and depth); roughing and finishing were needed to hold the tolerances.

To drill and tap angle holes, the box jigs had to be located on angle plates, necessitating the lifting and lowering of jigs for every hole. Drilling and tapping of the taper pipe threaded outlet and inlet bosses were done in two separate operations, using two jigs and an angle plate.

How the Machines Paid Off

1. **Drilling time was slashed 50 per cent.**
2. **Salvagework was reduced because holes have better depth tolerances.**
3. **Electric power consumption was trimmed. Three motors, each 1 hp, replaced fifteen 2-hp motors.**
4. **Drilling was the production bottleneck, so leadtime was cut; deliveries were improved.**
5. **Metal seat surfaces were improved because the range (200 to 400 rpm) made right speed possible.**



Here are the three machines that cut drilling time in half. Close-ups show: 1. Drilling of the ball seat and angle holes. 2. Drilling and tapping four taper pipe threads. 3. Drilling, tapping, and counterboring holes that used to be made on a chucking machine

• **Solution**—Engineers at Howe & Fant Inc., East Norwalk, Conn., were asked to tackle the problem. They designed and built a special jig and the tooling to demonstrate the features of their turret drill press for the most critical drilling jobs. Then they invited Air Reduction's engineers to the plant.

On the strength of the showing, three machines and the tooling were bought to handle all the drilling operations.

• **New Way**—The first two chucking machine operations are essentially unchanged. The third has been transferred from the chucking machine to a Howe & Fant machine, using a Hartford Super Spacer and a special fixture.

A second H&F machine drills the ball seat and angle holes. This job uses a trunnion type fixture operating on a 3-in. H&F universal positioning table.

All four taper pipe threads are tapped (and the holes drilled) on the third turret drill press, again using a Super Spacer and index table. One angle hole could not be economically included in the fixtures, and it is drilled on a Snow machine, using a simple air-actuated holding fixture.

• **Payoff**—Armed with estimates of production rates and cost savings, Air Reduction engineers took their story to management and got an appropriation for $16,600 to cover the cost of the three new H&F machines, the Snow drilling machine, and all the necessary tooling.

Engineers estimated the expenditure would be recovered in one year. Actually, direct labor savings alone almost paid off the investment.

Operator applies CO_2 semiautomatic gun to build up cavities. The method is rapid (deposits 15 lb an hour) and is said to be less expensive than many older methods

CO_2 Welder Makes Casting Repair Easier

Semiautomatic machines offer founders another way to cut production costs. Gas shielding eliminates slag removal, speeds rate of metal deposit, and cuts labor costs

By J. J. CHYLE
Director of Welding Research
A. O. Smith Corp.
Milwaukee

CASTERS and welders often have the same problems. What helps one helps the other.

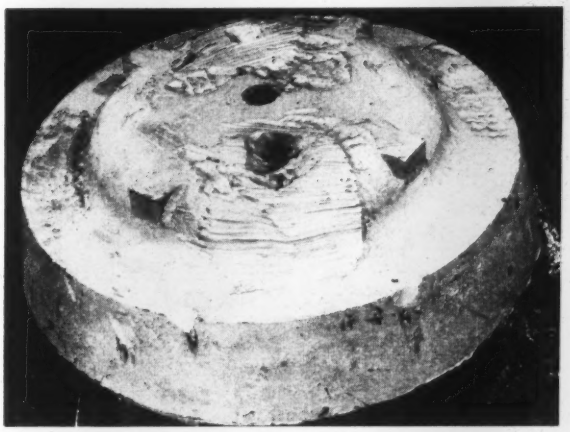
CO_2 welding is a case in point. It's fast, accurate, and well suited for foundry use. We think it's one of the most significant developments in arcwelding during the last ten years. Here are some of its advantages:

The process has a high cost reduction potential.

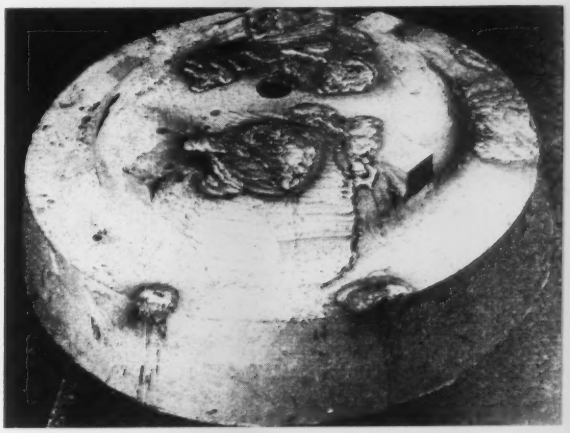
It produces weld metal deposits of high quality.

The arc is visible and does not require a flux (that eliminates slag removal and cleaning).

Other characteristics: Extremely deep penetration and easy adaptability to manual or fully automatic operation. The carbon dioxide shield practically eliminates hydrogen embrittlement behind the weld and in adjacent parent metal.

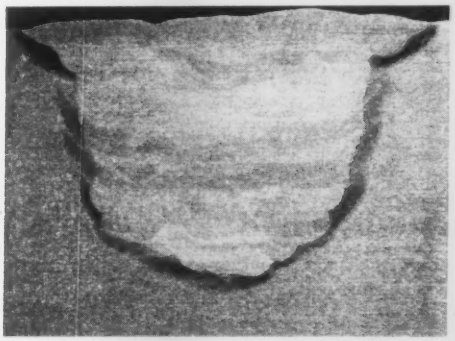


Typical steel castings like this one frequently need surface repairs of gas holes, inclusions, and riser removals. Carbon arc air gouging is a good method



Repairs here are ready for surface grinding. Note the absence of slag. The method works well in joining several castings into an assembly (castweld)

Same casting, finish ground and cleaned up, is ready for machining. Author cites example for which deposited metal cost 43 cents per pound



Cross section of weld area shows even deposition, narrow heat affected zone, and even buildup. There is usually no significant physical difference between casting and deposit

• **Equipment** — Essential elements include a feeder for small wire (1/32 in. to 3/32 in.) which passes through a contact tube in a gun. A nozzle surrounds the tube and wire directing a flow of carbon dioxide gas. Wire speed runs from 100 to more than 600 ipm. Current density is high—it can run 400 amperes with an arc potential of 27 to 38 volts.

You also need a power supply which provides adequate and reliable current, a head to feed the wire automatically, and a control system to adjust wire speed during operation. The automatic head has a nozzle for small diameter wire. It also protects the arc and molten puddle with carbon dioxide.

We believe that equipment design is important. The head must maintain high feed rates yet control arc length. The nozzle design affects arc and puddle shielding.

• **Application**—Fully automatic equipment is primarily for parts that can be put in a fixture. Steel foundries will find it most helpful in joining two or more castings.

Chief elements of the semiautomatic are a hand gun with attached flexible tubing for the wire feed, welding current, water cooling, and gas protection. Such equipment is probably the most versatile.

A trigger on the gun handle starts feeding the wire and turns on the power. A small rod near the nozzle is a guide for high speed welding, especially for the light sections where you want to use speeds of 125 ipm. Although the nozzle is water cooled the gun is light. A shield protects hands from heat.

At present, we like direct current with positive polarity for the power supply. Rectifiers work well, although motor generator sets can be used. In another type, called the constant potential direct current

source, control is the result of maintaining wire feed at a constant value so that current is automatically adjusted to the wire speed. As speed increases, so does the current. (In fact, the current is obtained from a wire speed setting in the welding head.) Both the constant current and constant potential types work well with the carbon dioxide process.

• **Costs**—One of the chief reasons for the economy of this method is low gas cost—about 1 cent per cubic foot, which may vary with purchasing volume.

(The gas must have a low moisture content, usually specified as a dew point of minus 40° F.).

Other costs depend on materials and labor. That's why deposition rates are so important. In CO_2 welding, rate is directly related to current density. At 400 amperes, for example, you can deposit about 15 lb an hour. That is considered a high rate and accounts for the fact that the cost per pound of weld metal is lower than that of other welding processes.

For example, if you have a repair that requires three layers of metal and a preheat of 200° F, you can deposit 2¾ lb of metal in a little under 9 minutes. Say the cost of the repair comes to $1.20. On that basis you can lay down a pound of metal for about 43 cents.

• **Application to Salvage** — Although the method can weld some low alloy steel castings, its chief application is in repairing steel castings made of the low, medium, and higher carbon grades.

Salvage economy depends on welding time. The breakeven point is related to the cost of salvaging, versus the cost of a new casting.

One foundry has an arbitrary rule: Divide the castings into different weight groups: Those weighing up to 50 lb can stand an arc time of 1 minute; those of 50 to 400 lb can justify up to 7 minutes; 400 lb pieces and up can handle 25 minutes.

That rule may vary from one foundry to the next, but it's a starting point. It's logical that an exceptionally large casting (say 1000 lb to several tons) might easily qualify for several hours of arc time.

Ford makes 1900 piston pins an hour in this press, finds . . .

Cold Extrusion Saves Metal

COLD EXTRUSION saves material in making piston pins at the new Ford Motor Co. engine plant in Lima, Ohio.

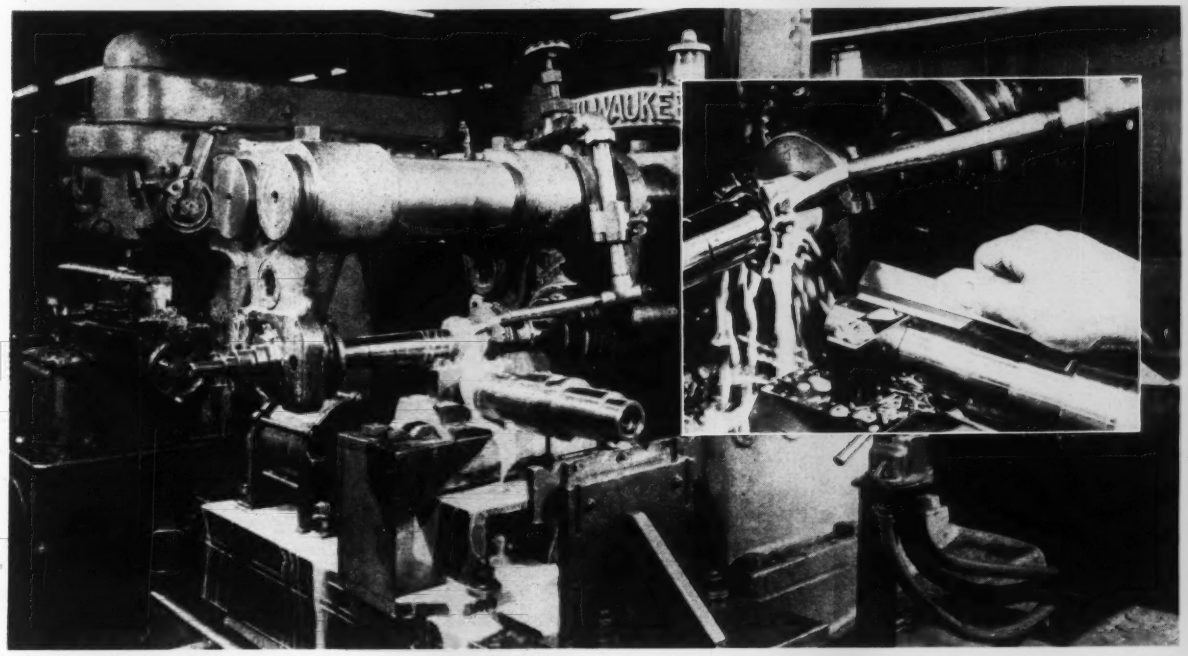
Steel slugs 2⅜ in. long are coated with phosphate and a liquid soap lubricant, then positioned automatically in the press. Carbide punches strike the ends of each slug with 100 tons of pressure; cold metal is forced into dies to form a piston pin 3½ in. long.

The pin is struck a second time by flat punches to square the ends, then ejected automatically.

The pins go through heat treat furnaces, then automatic grinders which finish the outside diameter.

• **Electronic Inspection**—An electronic sorting machine in a temperature controlled room inspects all pins before they are sent to assembly areas. They are sorted into three classifications as to size and weight; those not meeting rigid engineering specifications are ejected automatically.

• **Reduces Drilling** — Before the cold extrusion method was developed, piston pins were made by drilling out the interior of slugs whose length was the same as that of the finished pins. That method wasted time and material. The only drilling needed in making an extruded piston pin is that required to bring the pins within weight tolerances.



This cutting oil with nonfoaming agent does not froth or splash. Close tolerances are maintained because the oil cools and lubricates the tool and the material being milled

Cutting Fluid Ups Machining Efficiency

Soluble, heavy duty oil doubled milling machine tool life. It's more economical than other types, is used in less concentrated form, has longer life

SOLUBLE, heavy duty cutting oil, developed by Gulf Oil Corp., has improved efficiency and economy of machine tool operations at the Milford, Conn., plant of U. S. Electrical Motors Inc.

• **New Mixture**—The oil is mixed with water in a 35 to 1 (water-to-oil) ratio, rather than the conventional 10 to 1. It's used on a Milwaukee milling machine which cuts keyways in motorshafts. Better cooling properties of the mixture have doubled tool life on the milling machine, says the company. Service life of the mixture is three months, vs. three weeks for conventional cutting oils.

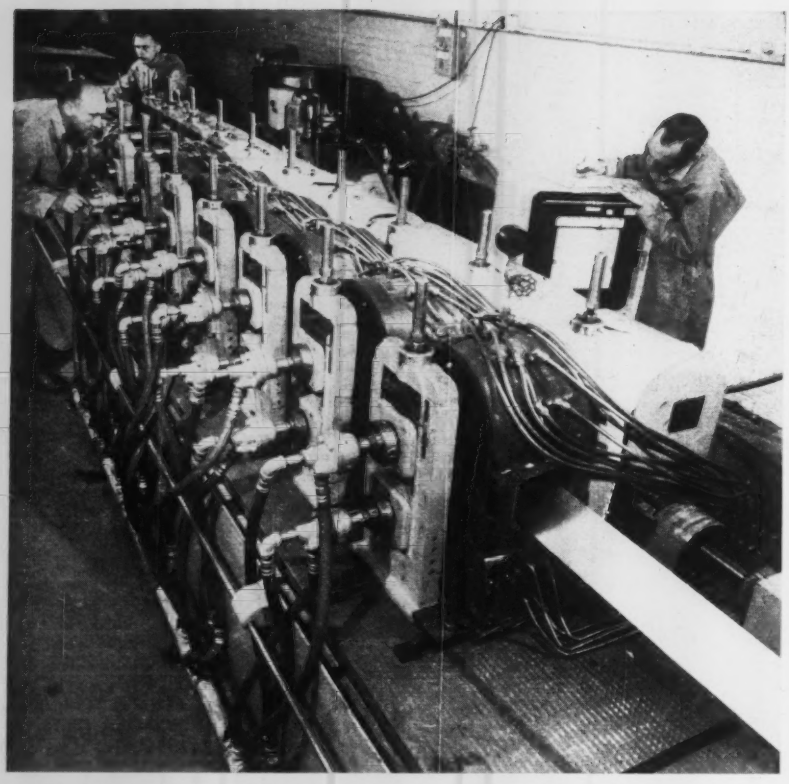
• **Helpful in Drilling**—The oil has proved valuable in the deep hole drilling of hollow shafts for motors, another difficult operation in the manufacture of industrial motors. A dual-spindle Pratt & Whitney machine, powered by two Varidrive units made by U. S. Motors, drills two shafts at the same time; hole diameters run 11/32 to 1 9/16 in., and shafts may be as long as 25 9/16 in. Heat dissipation is a big problem.

• **The answer:** A heavy duty, sulfochlorinated fatty oil delivered to the cutting edge at 40 gallons per minute under 200 psi. It cools the work, saves cutting edges of the tool, and removes chips.

• **Closer Tolerances**—A thin but durable antiweld film is formed between the chip and the tool, permitting closer tolerances on critical cutting jobs. Surface finishes are said to be better than called for in specifications. One case: 1045 hot-rolled steel was drilled with a 1 9/16-in. drill at 7/8 in. per minute with a surface speed of 350 fpm. The inside diameter of the hole was held to within 0.002 in. of drill size. The surface finish was 45 to 50 microinches.

• **Controlled Suds**—A nonfoaming agent in the oil prevents excessive frothing and reduces oil splashing on machinery and personnel. A side benefit: Oil is allowed to flow more freely to and from the work.

• **Oil for Stampings**—Three high production, 150 ton stamping presses are used to pierce rotor laminations for electric motors. To keep the multiple-punch piercing dies sharp, the 26 gage silicon steel blanks are coated with a mineral lard cutting oil which will not stain or corrode the stampings. Such lubrication protects tools from the extreme abrasive action of the silicon steel blanks.



Modified Yoder Roll used at Boeing Airplane Co. to hot form titanium

Hot Roll Forms Titanium

Successful use of heated dies in forming the material led Boeing engineers to try red hot rolls. They built a furnace around each station in a Yoder machine

HERE is a new way to hot form high-strength titanium alloys.

It's being done on a Yoder Roll by encircling each set of rolls with a gas-burning furnace. The unique machine is used at Boeing Airplane Co., Seattle, to form titanium alloy strip as long as 32 ft.

• **Must Be Formed Hot**—In many cases, the metal can be formed only in the 1000 to 1600° F range. Some forming operations lend themselves to the use of heated dies, but modification of a Yoder Roll presented a more difficult problem.

• **How Rolls Are Heated**—Boeing's factory engineers developed the technique of enclosed heating to reach the required forming temperature. Each furnace has 18 burners on its periphery. In operation, the rolls glow a dull red.

To prevent bearing trouble, hollow shafts were installed—cooling water circulates through them. Bearings run cool despite the temperature of the rolls.

• **Use Propane for Fuel**—A standard combustion control unit provides premixed propane gas to the burners, although natural gas would work as well, say Boeing engineers. It takes about an hour for the rolls to reach the correct forming temperatures.

Tests have been run at a rolling speed of about 1½ fpm, although it is believed that speeds 12 to 15 times as fast are feasible. Most tests have been with titanium alloy strips about 8 ft long.

Fasteners Simplified

New bolts and nuts may replace four classes of square and hex products, says manufacturer

PROGRESS is plowing under one of industry's most familiar products (the common square headed bolt and square nut), in the opinion of fastener experts at Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

• **Program Started** — The fastener manufacturer has initiated a project to simplify its products. By consolidating the best features of several types of fasteners in one hex bolt, it believes that square fasteners will soon be obsoleted as standard products.

The company says the fastener gives industry the opportunity to turn out lightweight finished products with an appealing appearance. RB&W expects the hex bolt and nut to replace square head machine bolts with rolled or cut threads and square nuts, hex head machine bolts and hex nuts, bright cap screws with NC threads in the solid die range (generally the smaller diameters and shorter lengths), and separate nuts.

• **Faster Assembly**—Six-sided units permit faster, easier wrenching under confined conditions. Hex nuts are double chamfered and double countersunk in the popular diameters, permitting correct assembly from either side. Hex bolts are washer faced in the popular sizes to improve the bearing face of the bolt and ease head wrenching.

Standardizing on hex bolts and nuts allows use of either a 6 or 12-point socket wrench and reduces the need for stocking square wrench sizes. The same open socket or box wrench size can be used for the bolt and the nut.

• **Costs Eased** — Square nuts and bolts have predominated chiefly because the hot forming process has been more economical on square products than the hex. Modern production equipment, plus adoption of hex nuts and bolts by major consuming groups, makes the offering of a full line of hex products feasible from a cost standpoint.

US RUBBER STEEL MILL GRINDING WHEELS

PERFORMANCE DETERMINED IN ADVANCE ...for Cost-Minded Grinding Foremen

All steel mill wheels, hot or cold pressed, made by U. S. Rubber must measure up to the steel foreman's exacting requirements before delivery to the mill. "U. S." puts steel mill wheels to the test on rail-mounted "Ty-Sa-Man" automatic grinders in its own plant. The grinding wheel is tested under the same conditions and pressures encountered on the job in the steel mill.

The "Ty-Sa-Man" determines, for example:

1. Metal removable per hour.
2. Total metal wheel will remove.
3. Wheel life.
4. Cost per pound of metal removed.

These facts are determined for the cost-conscious grinding wheel superintendent or foreman *before* the wheel goes into service. Guesswork is out—certainty is in.

The U. S. Rubber salesman who serves the grinding wheel industry is a specialist selling grinding wheels only. He has back of him the wealth of experience accumulated by U. S. Rubber's ninety-four years of filling the grinding wheel needs of industry.

Your U. S. Rubber salesman will stop in to invite you to make full use of the cost savings obtainable through the Ty-Sa-Man machine or write to address below.

US RUBBER

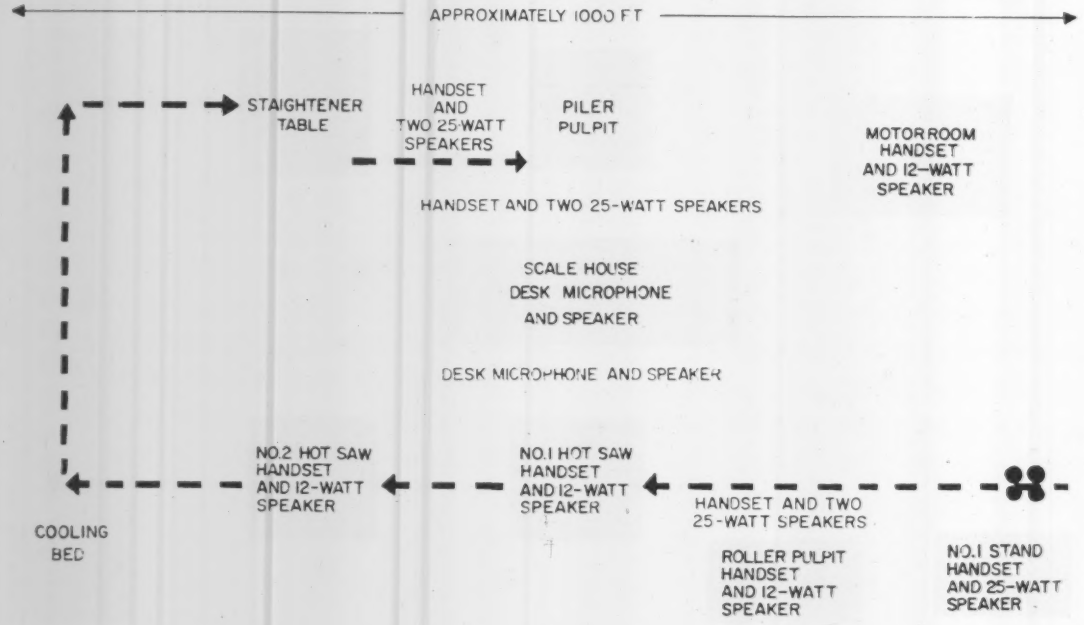
Mechanical Goods Division

United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y. In Canada: Dominion Rubber Company, Ltd.

Layout of Northwestern Steel's Mill Communication System


APPROXIMATELY 1000 FT
STAIGHTENER TABLE
HANDSET AND TWO 25-WATT SPEAKERS
PILER PULPIT
MOTOR ROOM HANDSET AND 12-WATT SPEAKER
HANDSET AND TWO 25-WATT SPEAKERS
SCALE HOUSE DESK MICROPHONE AND SPEAKER
DESK MICROPHONE AND SPEAKER
NO.2 HOT SAW HANDSET AND 12-WATT SPEAKER
NO.1 HOT SAW HANDSET AND 12-WATT SPEAKER
HANDSET AND TWO 25-WATT SPEAKERS
COOLING BED
ROLLER PULPIT HANDSET AND 12-WATT SPEAKER
NO.1 STAND HANDSET AND 25-WATT SPEAKER

Microphones and speakers eliminate 500 to 600 ft treks between stations

Paging Systems Are Cost Cutters

An engineered installation is saving a midwestern steel mill more than $450,000 a year. It minimizes downtime, improves quality control, cuts maintenance manhours

IN YOUR continuing search for new and effective methods to lower production costs, don't overlook loudspeaker paging systems. They can be important production tools.

Take the case of Northwestern Steel & Wire Co., Sterling, Ill. A new communication system installed at the company's 16-in. mill cuts mill downtime to a minimum by eliminating unnecessary trips between work stations by employees.

• **Typical Situation** — Suppose the "gager" at No. 2 hot saw inspects a structural shape and finds that it is "off section." Without the paging system, the procedure would be this:

The "gager" signals for a mill shutdown and walks to the roller's pulpit to tell him the trouble. The roller then walks to the worker controlling the stands and instructs him on what correction to make. The roller and gager then go back to their stations before the mill can be restarted. If the adjustment is not right, the process is repeated.

• **With Paging System**—The 500 and 600 ft walks are eliminated with the loudspeaker system. The "gager" signals for a mill shutdown and talks to the roller over the system. The roller instructs the worker at the stands in the same manner and adjustment is made in a fraction of the time it previously took.

When there are mechanical or electrical breakdowns, maintenance workmen can be paged anywhere in the mill. The trouble and location of the breakdown can be described and the individual can determine what tools and equipment he will

(*Please turn to Page* 120)

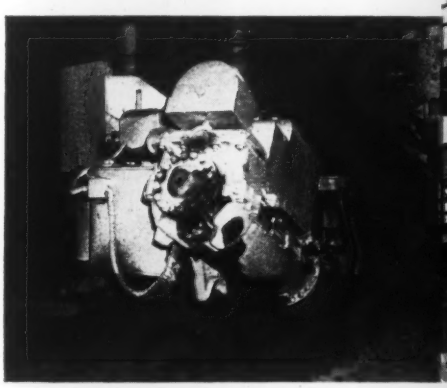
Used at KAISER STEEL since 1943

Furnace 1 1943
Furnace 2 1949
Furnace 3 1952
Furnace 4 1958

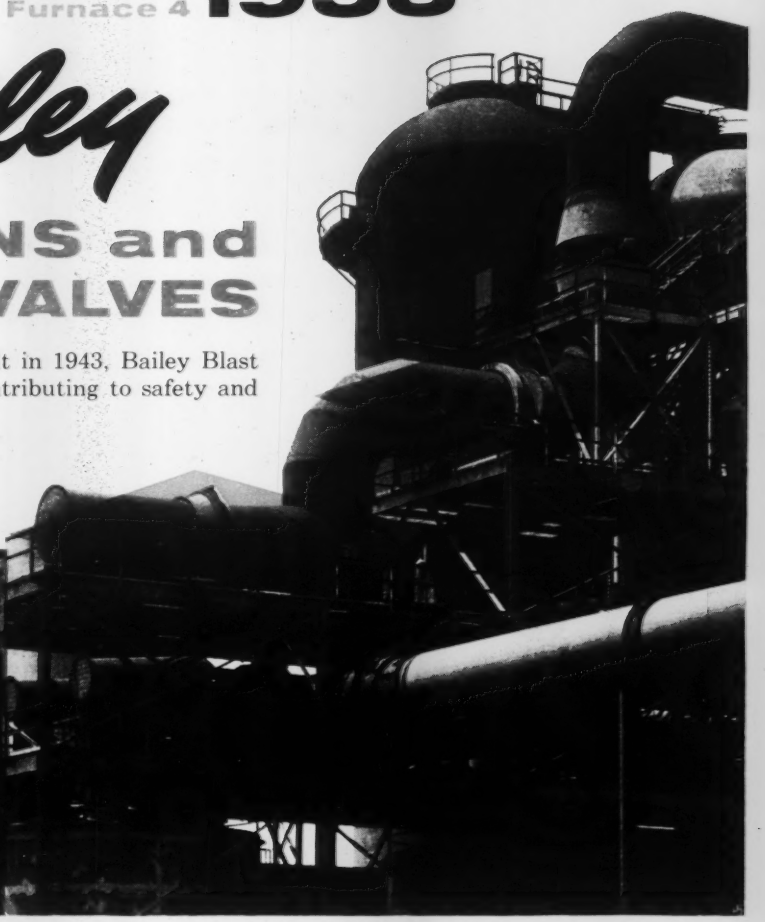
Bailey

CLAY GUNS and GOGGLE VALVES

Since the Fontana plant was built in 1943, Bailey Blast Furnace Equipment has been contributing to safety and efficient operation.

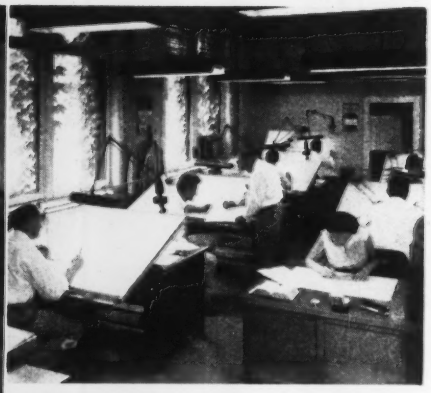


Bailey Clay Guns provide accurate positioning with high pressure for maintaining long tapping holes.



Bailey Thermal Expansion and Mechanical Goggle Valves protect men and equipment by controlling large gas mains. They are shown here in the half-open position while the newest blast furnace was under construction.

WILLIAM M. Bailey COMPANY
ENGINEERS
LEADERSHIP THROUGH QUALITY
1221 BANKSVILLE ROAD PITTSBURGH 16, PA



THOMSON'S PROBLEM-SOLVING TEAM of design and application engineers now meet most special requirements with readily available standard rivets and quickly assembled standard rivet-setting machines.

NEW TEAM OF SERVICE EXPEDITERS coordinates sales, order entry, production, inventory control, finishing and shipping activities to gear Thomson's rivet deliveries to customers' production schedules.

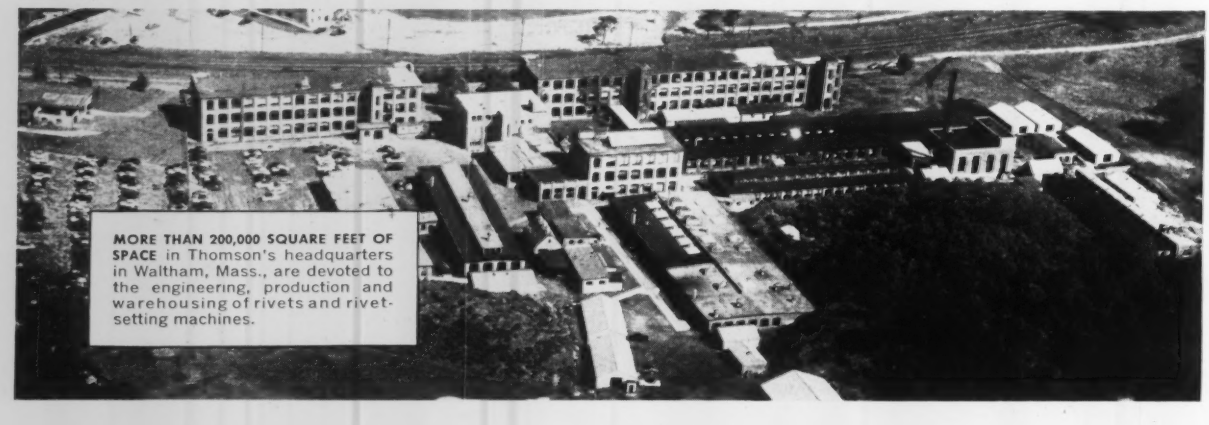
A CONSTANT INVENTORY OF SEVERAL MILLION POUNDS OF WIRE in more than 500 specifications backs up Thomson's mass-production capabilities.

20 MILLION A DAY....

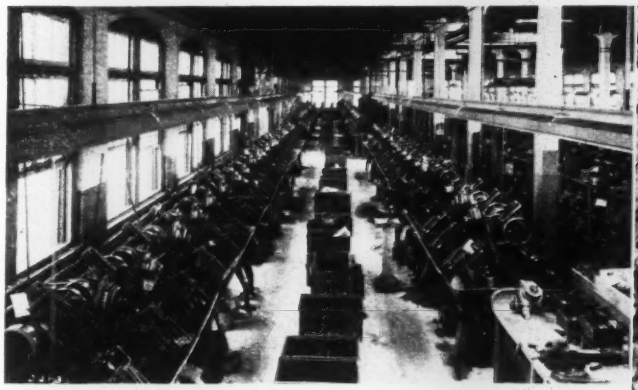
America's largest rivet manufacturer tailors its production and inventory to today's fast delivery requirements

Judson L. Thomson now keeps 500 million rivets in stock so that you can *keep your inventory low* . . . and still have rivets *when you need them.* This new production and inventory system is based on the 800 most-used standard rivets. It's backed up by productive capacity exceeding 20 million rivets a day.

When your order comes in, semi-finished rivets are quickly finished to your specifications . . . and delivery is geared to *your production schedules.* Next time you need rivets, order from Thomson . . . first with the best in rivets and rivet-setting machines since 1885.



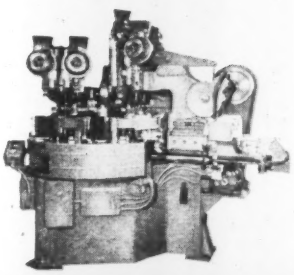
MORE THAN 200,000 SQUARE FEET OF SPACE in Thomson's headquarters in Waltham, Mass., are devoted to the engineering, production and warehousing of rivets and rivet-setting machines.

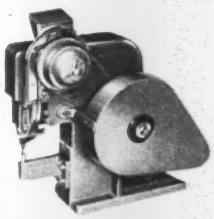


PRODUCTIVE CAPACITY EXCEEDING 42,000 RIVETS A MINUTE easily implements Thomson's new policy of maintaining an inventory of 500 million rivets in the 800 most-used standard specifications.

500 MILLION RIVETS CARRIED IN STOCK IN MORE THAN 800 STANDARD SPECIFICATIONS plus 8,000 rivet specifications completely tooled-up enable Thomson to meet ordinary, and extraordinary, demands in the shortest possible time.

SPEEDS RIVETS YOUR WAY





JTL

JUDSON L.

THOMSON

22 SAWYER ROAD

MFG. CO., WALTHAM 54, MASS.

MORE THAN 200 STANDARD AUTOMATIC FEED RIVET-SETTING MACHINE MODELS, quickly assembled from stocked parts, include bench and floor types air, motor or manually operated, with single and multiple heads. Special work-handling and loading devices, radial or turret feeds and other accessories are available for accelerating assembly and speeding up production.

PAGING SYSTEMS . . .

need to take to the trouble spot. Only one electrician and two millwrights are required per shift.

• **Estimated Saving**—Northwestern Steel officials estimate that the installation saves more than $450,000 annually by cutting mill returns, improving quality control, cutting maintenance manhours, and reducing accidents.

The loudspeaker system was designed by R. W. Neill Co., Chicago. Mill noise poses the chief problem in this type installation and ambient noises are overcome by using filters in the amplifiers which limit the frequency range from 300 to 3000 cps.

"Each industrial plant presents a different problem," explains Bernard L. Wikel, chief engineer at Neill. "Some noises can be penetrated; others you must override. Important, too, is the area to be covered—that's why in the mill installation we used speakers of varying power-handling capacities suited to the specific locations."

Handle Eases Steel Lifting

Hard-to-handle sheet steel, bar stock, and angle iron can be moved easily with a new magnetic "handle" that can pick up over 300 lb.

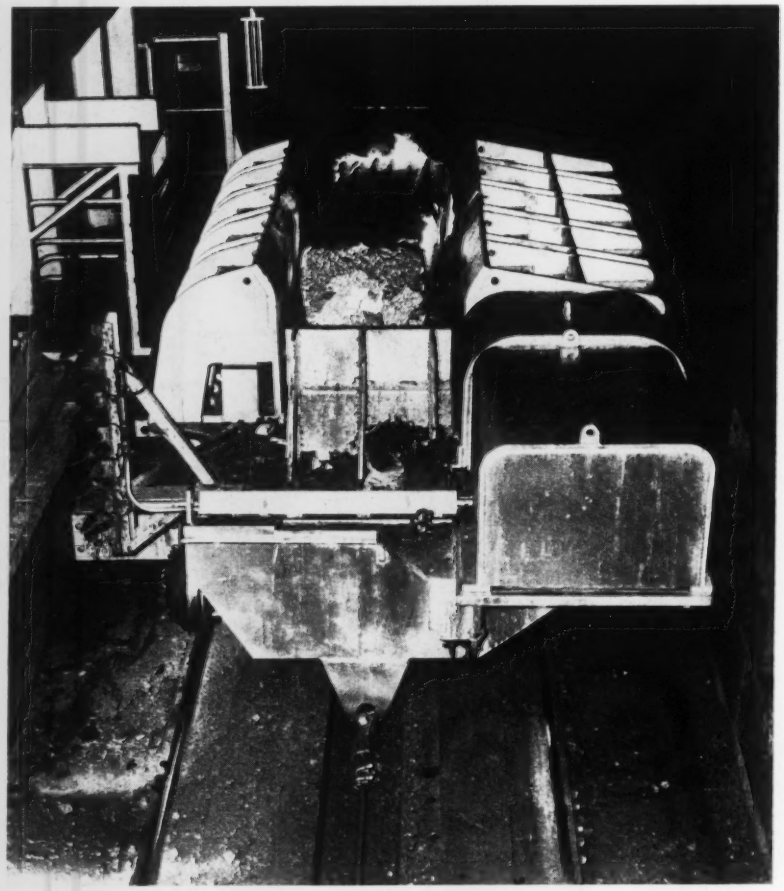
Called the Bearpaw, the tool consists of powerful Indox magnets embedded in Vibrin polyester plastic (made by Naugatuck Chemical Div., United States Rubber Co.), a metal housing, and a large handle.

• **Uses Vary** — Ducommon Metals & Supply Co., Los Angeles, uses the handle manually in warehousing steel bars and rods. United Concrete Pipe Corp., Azusa, Calif., uses several of the handles on the lifting bar of a large winch to move plate steel in its plant. Superior Fireplace Co., Fullerton, Calif., uses the handles manually in positioning steel plates in a shearing machine. Circle Tool & Engineering Co., Whittier, Calif., uses the handles manually or with a small winch to move steel stock.

The Indox magnets are energized initially (converted into permanent magnets) with an induction coil. They differ from better known magnets in that their magnetizing force extends only 1/16 in.

• **How To Use It**—The base of the tool is placed on the metal, and the lift made by hand or winch. To disengage the tool, its handle is pushed forward. This causes the base to protrude beyond the magnetic elements, and the tool is pried free.

The Bearpaw is available from Smith's Magnet Sales Co., Whittier, Calif. Retail price is about $40.



Deliveries from soaking pit to rolling mill improve with . . .

Ingot Buggy Stops Preset

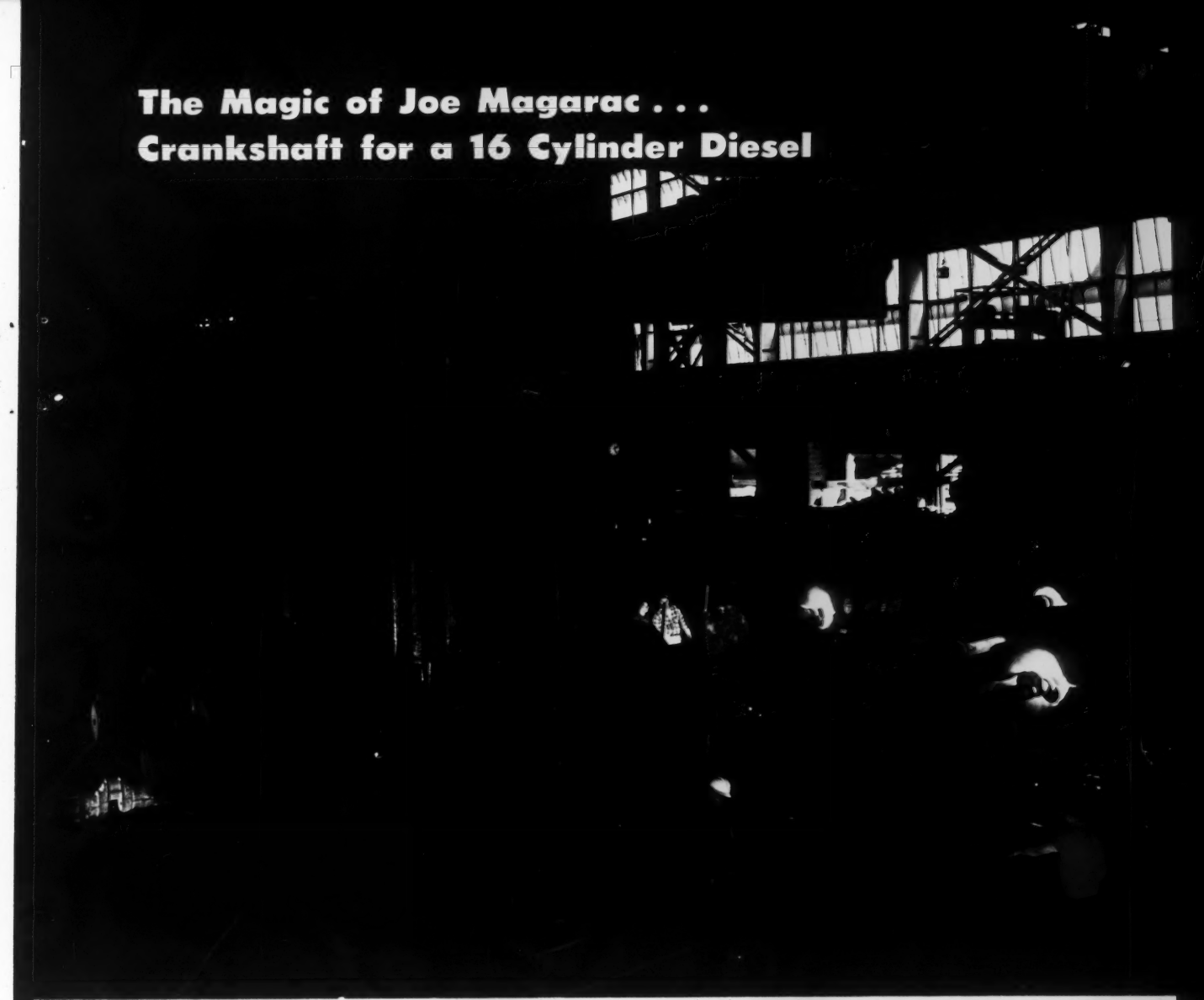
IMPROVED ingot handling for rolling mill operation is provided by an automatically positioned buggy at the Geneva Works, Columbia-Geneva Steel Div., U. S. Steel Corp., Provo, Utah.

The use of a magnetic amplifier control system has almost eliminated downtime resulting from electrical failure of the buggy and has reduced the time for its 370-yd trip from soaking pit to rolling mill and back. The buggy is attached to a cable running between two drums at either end of the route.

Prior to the installation of the special control system (made by General Electric Co.'s Industry Control Dept., Roanoke, Va.), the unit was self-propelled and remotely controlled. Now an operator directs transportation of hot ingots by pushbutton, precisely positioning the buggy's stops.

Selsyn interconnections have made possible the location of the master control panel in a dust-free room where heat is controlled.

The Magic of Joe Magarac . . .
Crankshaft for a 16 Cylinder Diesel



Joe grabs a white hot bar from the heating tunnel . . . his magic converts a 3000 ton Forging Press to 10,500 ton. The 4 way squeeze forges a Diesel Engine crankshaft section. Just like that! Throws are forged to the correct angles in one operation.

Above you are looking at 4 crankshaft sections going through heating tunnels, then taking their turn in the "big squeeze." They will wind up in the heart of a 16 cylinder Diesel Engine to power a railroad locomotive, a ship at sea, a city's heat and light, a monster machine of industry.

Your steel forging and casting components are made to specification from raw materials to finished product here. Skilled metallurgists, engineers and craftsmen keep an eagle eye on every operation . . . your assurance of the highest quality steels. Consult with us.

ERIE FORGE & STEEL CORPORATION

ERIE, PENNSYLVANIA

MEMBER AMERICAN IRON AND STEEL INSTITUTE

TUBING PROBLEMS?

Get help in less than 24 hours from

BISHOP'S QUICK SERVICE TEAM*

Don't let tubing problems delay your operations! When you need help in a hurry, call in BISHOP—manufacturers of *unexcelled* quality tubing. Within 24 hours BISHOP's Quick Service Team (QST) will go into action to provide expert assistance on your specific problems.

What is this Quick Service Team? It's a corps of metallurgists and specialists who will provide *sound*, sure advice . . . qualified men in sales who *know* tubing, are pledged to give *fast* reliable service . . . and production experts who will push your job through for *quickest* possible delivery.

BRIEFLY, THE BISHOP LINE...

STAINLESS STEEL TUBING Seamless, Welded & Drawn	Mechanical, Aircraft, Capillary, Hypodermic also NEW Stabilized and L grades, precipitation hardening alloys	0.008" to 1.000" OD 0.003" to 0.083" wall
NICKEL & NICKEL ALLOY TUBING	All standard grades	up to 1.000" OD 0.065" wall max
TUBULAR FABRICATED PARTS	Flanged, flared, milled, slotted, swaged, threaded	
GLASS-TO-METAL SEALING ALLOYS	Low expansion alloys for glass sealing applications	
CLAD METALS & COMPOSITE WIRES	Base metals & precious metals in various combinations.	
PLATINUM GROUP METALS	Fabricated products—chemicals	
CATALOGS, DATA SHEETS ON THE ABOVE SENT PROMPTLY ON REQUEST		

Get help in a hurry—start the Quick Service Team working for you. Contact Bishop by phone: Malvern 3100, by TWX: Malvern 570, or call your local steel warehouse.

Tubular Products Division

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platinum works

MALVERN, PENNSYLVANIA

Device Freezes Air To Produce Vacuum

Technique offers way to create low pressure atmospheres for many industrial applications

AN IMPROVED method of producing extremely high vacuums makes large scale applications economically feasible.

Called Cryopumping, it is a refrigeration process that produces such a low temperature that all the air in a chamber freezes to a solid, leaving a high vacuum.

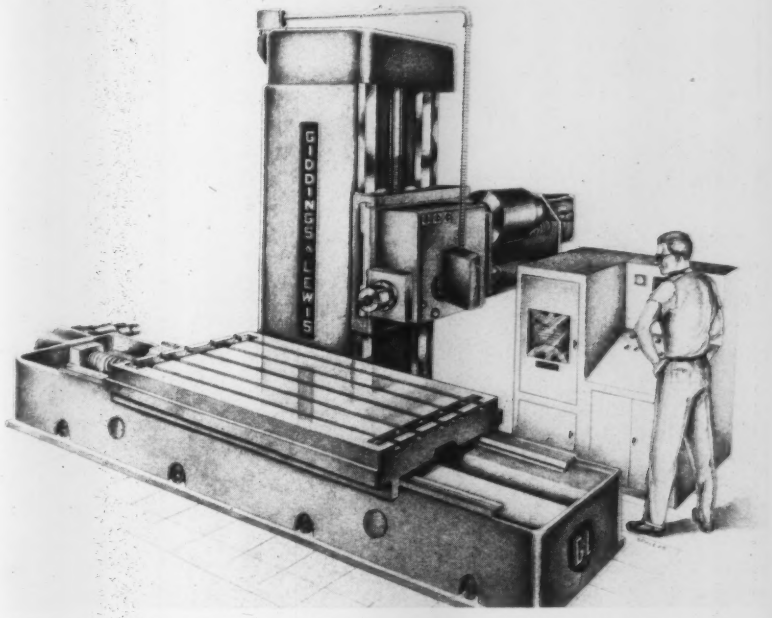
• **Used in Research**—The technique is already being used for research in a University of Southern California wind tunnel. By freezing the air in one end of the tunnel, Cryopumping creates a vacuum that causes the air in the other end to rush past models of missiles at hypersonic speeds.

The technique was introduced to the American Vacuum Society at the Third National Vacuum Symposium in San Francisco. The paper was co-authored by Bruce M. Bailey of Arthur D. Little Inc., Cambridge, Mass., and Dr. Raymond L. Chuan, director of the University of Southern California's Engineering Center.

• **How It Works**—The Cryopump is an extreme low temperature refrigerator that uses helium at minus 420° F as the refrigerant. At present, the technique is used most efficiently with mechanical pumps, Mr. Bailey stated. While the pumping speed of a mechanical system falls off rapidly as the vacuum increases, a Cryopump works particularly well when a relatively high vacuum exists, he explained. A combined system makes use of the advantages of both methods.

With the Cryopump, it is possible to produce extremelv low pressures (about one one-millionth of our normal atmospheric pressure). The temperatures involved are those believed to exist on the dark side of the moon.

Dr. Chuan developed the first large scale application of the technique—the hypersonic wind tunnel. Mr. Bailey and his colleagues at Arthur D. Little Inc. developed the Cryopump.



G&L's numerically controlled machine represents a breakthrough. Significance: It could accelerate style changes for everything from auto bodies to bathtubs

Diesinking Costs Slashed

ALL metalworking may reap the benefits from the latest application of numerical control to a metal cutting machine.

Numerically controlled diesinkers promise more than 50 per cent reduction in the manufacturing time of molds and dies. Leadtime for auto model changes could be cut in half when bodies are mathematically designed to permit programmed machining of dies.

More frequent styling changes could become practical for manufacturers desiring faster product obsolescence. Delays due to shortage of diesinking time during critical production periods could be eliminated or minimized.

• **Prototype Proves Worth** — Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., has developed a new diesinker, called the DiMil, which is operated by the company's Numericord, a continuous path, magnetic tape control system.

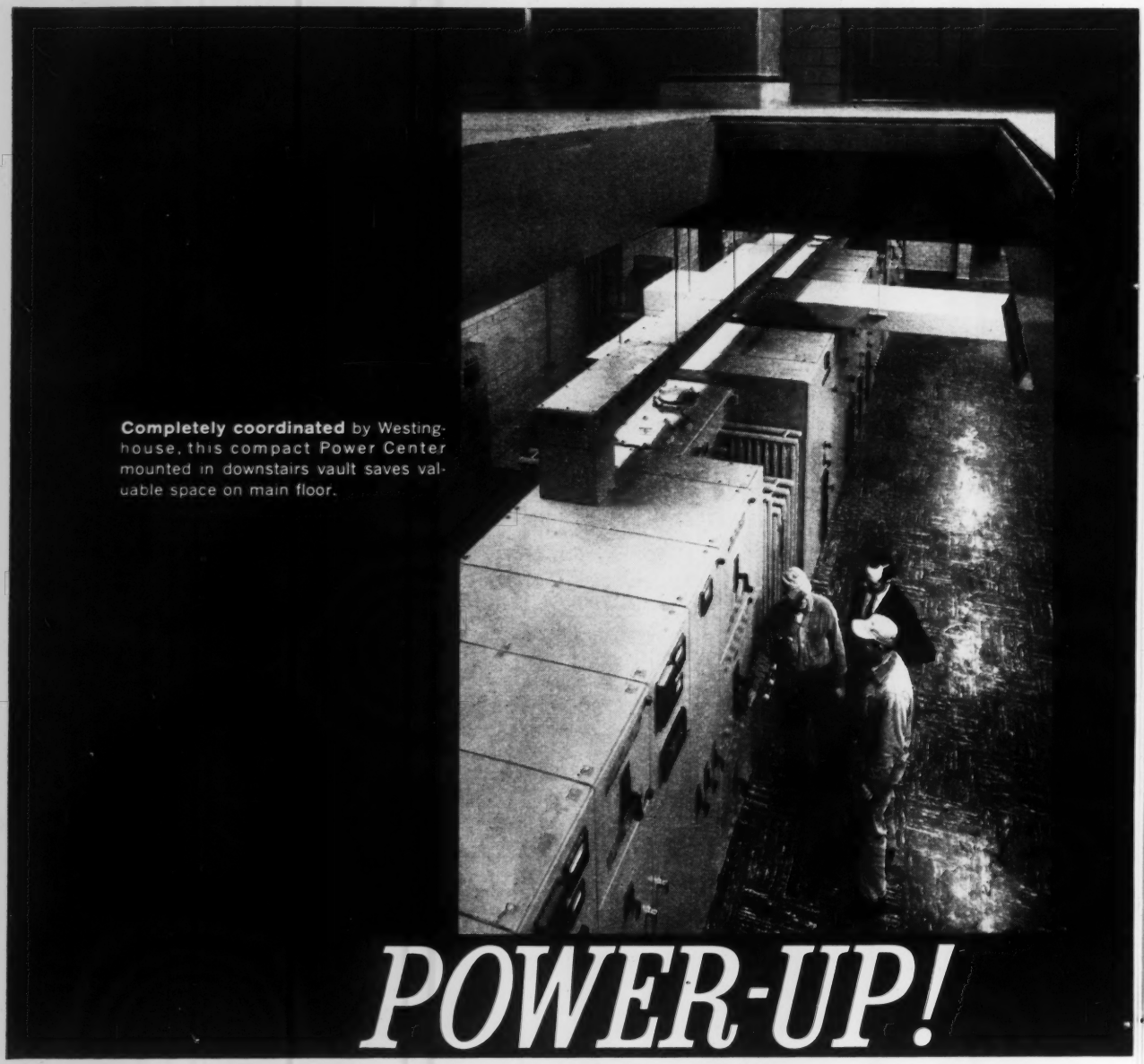
Using the DiMil, a large hammer die was produced with a 43 per cent reduction in the manufacturing time required for the template method. "Manufacturing time" included complete programming and recording of the tape.

Machining time was reduced 67 per cent. Bench-and-polish time was cut 62 per cent. A duplicate of the first die was machined with a reduction in total manufacturing time of 77 per cent, compared with the template method.

• **Designed for Many Jobs**—Under tape control, the G&L milling machine will generate any defined surface. It can be programmed for profile milling of dies, molds, cams, templates, prototype and production parts.

Basic programming information is put on IBM cards which are fed to an electronic computer to produce a manuscript and a deck of punched cards. Information on the cards is converted to a paper tape which, in turn, is used to make the magnetic tape.

Computing and tape recording are relatively rapid operations. One computer and Numerical Control Director can handle a large number of tape-controlled machines.



Completely coordinated by Westinghouse, this compact Power Center mounted in downstairs vault saves valuable space on main floor.

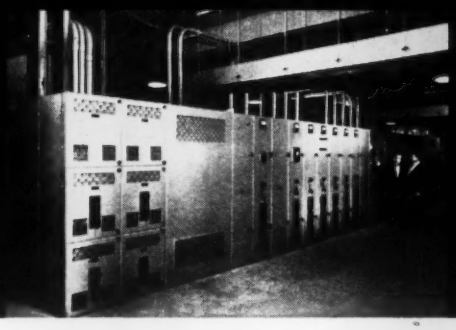
POWER-UP!

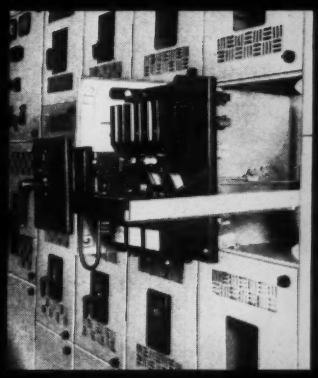
for profitability...

modernize your distribution system with compact Power Centers

Balcony-mounted Power Center solves problem of scarce floor space in crowded production areas. Light weight and greater safety of dry-type transformer make such an installation feasible.

Indoor ventilated dry-type Power Centers end the need for oil reconditioning and associated problems. Continuous, close-coupled line-up of low-voltage switchgear, transformer and primary gear results in more pleasing appearance.





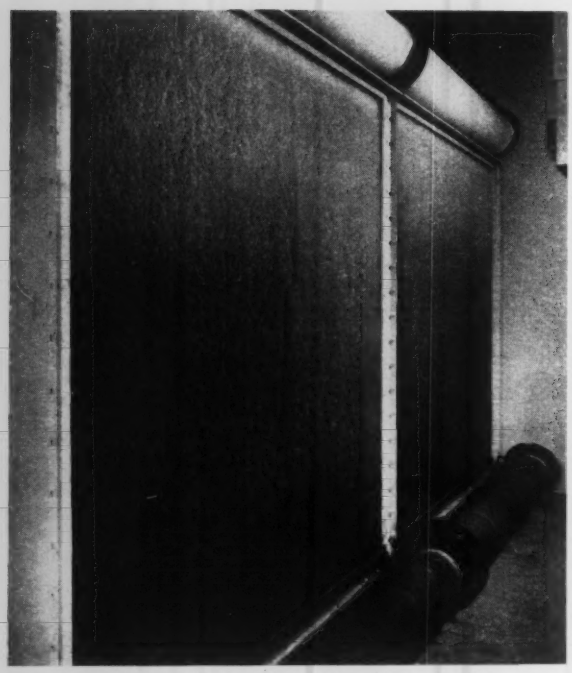
Dependable circuit protection assured with Westinghouse low-voltage metal-enclosed switchgear. Type DB breakers use proven De-ion® principle for quick arc extinction. Three-position drawout construction permits breaker to be in operating, test or disconnected positions, with door closed for greater safety to personnel and protection of equipment.

Electrical modernization calls for more efficient distribution of power in your plant. Distribution from your main sub at utilization voltages throughout a plant can be mighty expensive! Line losses mount. Voltage regulation is poor . . . motors lose torque and horsepower . . . and lighting efficiency fades.

Westinghouse Power Centers permit you to get power close to your load at high voltages . . . provide greater flexibility to your electrical system, slash line losses, give increased power continuity. They're all packaged—transformer, breakers and associated equipment—factory-assembled to specification, ready to set down and connect. These compact units can be placed close to the load with short runs at utilization voltages . . . often right in the work area . . . because of their inherent safety.

To learn how an electrical Power-Up program can make your plant more profitable, call your Westinghouse salesman or contact your electrical contractor. Ask for a copy of the Power Chek-Up kit or write to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania, for a copy of DB 34-150. J-60945

YOU CAN BE SURE...IF IT'S Westinghouse



Filter traps dirt particles, rolls on throwaway reel

Air lance cleans precipitator plates of filter unit

Filters Whip Fume Problem

This air conditioning system keeps welding area clear and recirculates decontaminated air in winter to cut heating bills. Maintenance is easy, inexpensive

PROBLEM: Carry off fumes from 60 welding machines, operating 90 hours a week, to maintain a clean, comfortable work area.

Solution: An air decontamination system designed and installed by American Air Filter Co., Louisville.

In installing the system at its New Holland, Pa., facilities, New Holland Machine Co., a subsidiary of Sperry Rand Corp., not only solved the fume problem, but assured efficient heating of the welding area.

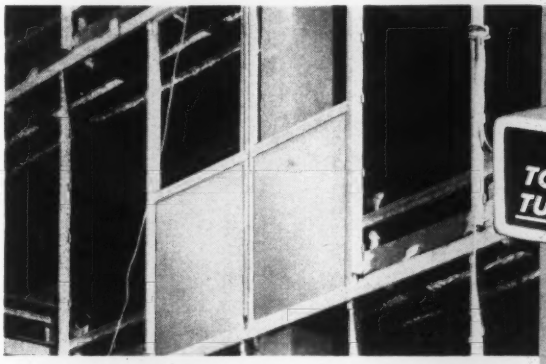
• **Heating Bills Cut**—The system removes fumes from circulating air by electrostatic filtration, mixes decontaminated air with a small amount of filtered air from outdoors, then carries the mixture over heating coils. Recirculation of heated air reduces fuel cost; the system provides adequate heating and ventilation in winter. In summer, when heating is not required, fumes are discharged outdoors.

• **How System Works**—Each of six filter units consists of an agglomerator and a storage section. A dry plate electrostatic filter in the agglomerator removes 90 per cent of the contamination from the air passing through it. Particles from the air build up in clusters on the precipitator plates and are eventually blown off into the air stream and carried to the storage section.

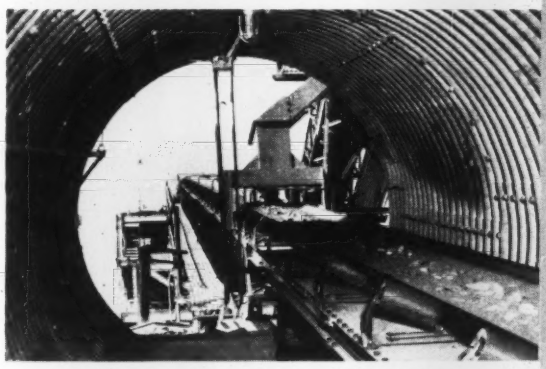
A curtain of glass fibers 2 in. thick, moving slowly from the top to the bottom of the filter, traps the agglomerated particles. The used curtain is wound on a reel, is discarded periodically, and a new curtain installed.

The system requires only about 1 manhour of maintenance per week of operation. Every six weeks, the precipitator plates, ionizing wires, and insulators are cleaned with compressed air, while the plenum floor is vacuumed. Every eight months, the filter medium roll is replaced. No water or cleaning solutions have been used on the filter system in three years of operation.

• **Conventional Disposal** — New Holland originally planned to install a conventional heating and ventilating system in which welding fumes were to be exhausted and makeup air brought in. Heating makeup air would have increased over-all heating costs by 75 per cent.



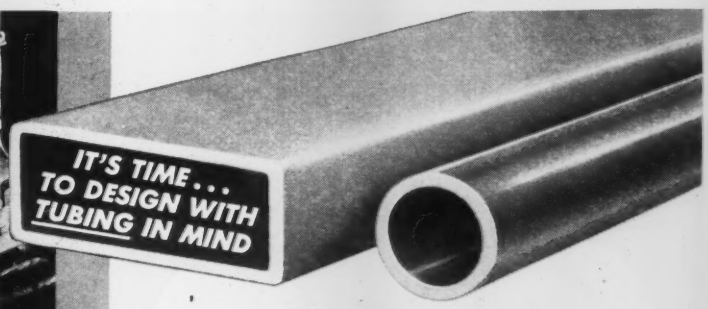
In curtain wall framing, welded steel tubing fabricates readily—joins easily—saves weight.



As conveyor rollers, miles of *welded* steel tubing are used each year for simplified fabrication, rugged strength and light weight.

Square carbon steel tubing creates a highly efficient load-bearing curtain wall in this new school design.

Easy to fabricate, easy to join, brute strong and light weight, welded steel tubing makes up this entire crane boom.



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Carbon • Alloy • Stainless Steel

The tubular form is engineering's most efficient structural section—and *welded* steel tubing offers in addition the greatest uniformity and formability of them all.

Welded tubing is concentric about its axis, uniform in wall thickness, readily formed to any cross section and available in many grades from low carbon through stainless steel.

When you have a structural problem requiring high strength-to-weight *plus* dependable uniformity—contact your quality *welded* tube producer.

FORMED STEEL TUBE INSTITUTE

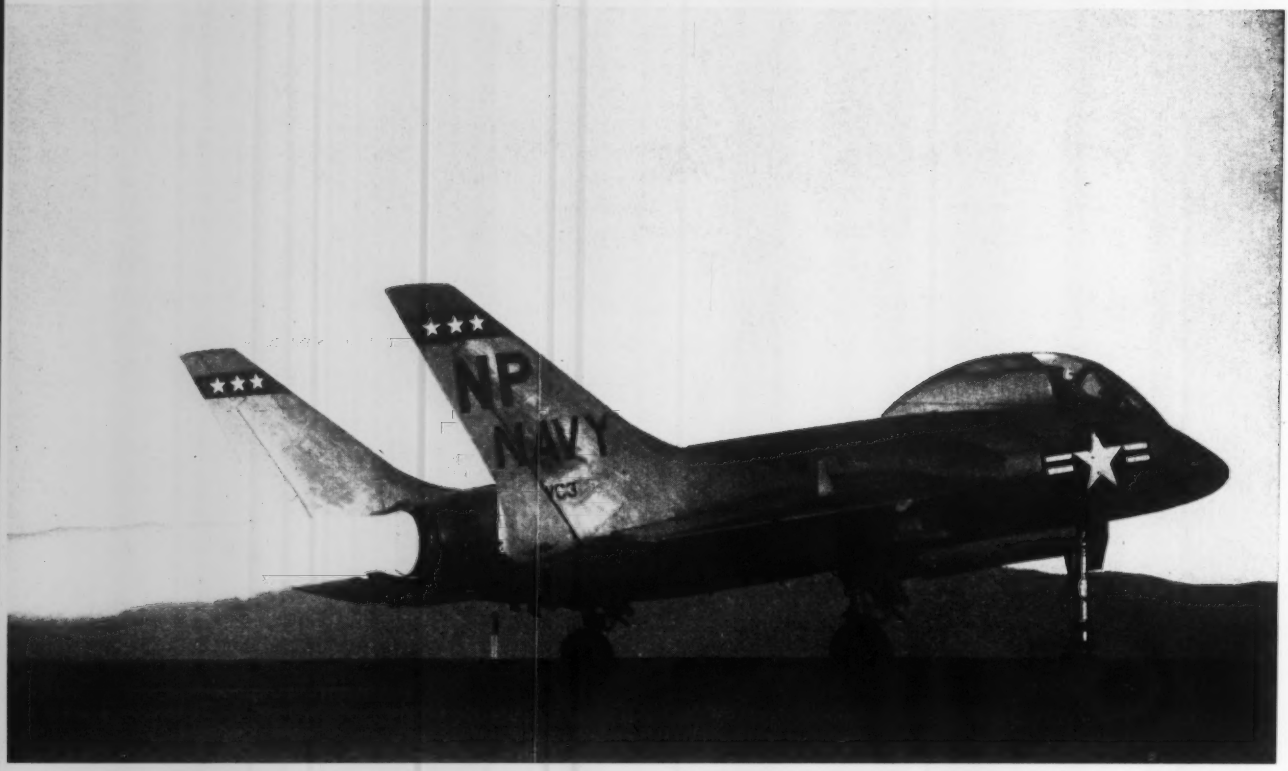
Specific information on welded tubing is available on request to:

FORMED STEEL TUBE INSTITUTE

850 HANNA BUILDING • CLEVELAND, OHIO

An Association of Quality Tube Producers

LC-584



This is one of the planes which proved the processing methods of Chance Vought Aircraft Inc., Dallas. It has wide variety of parts made of 4340 with ductility of Rc 50

How To Get More from High Strength Steel

Experience of aircraft firm shows that substandard performance often can be traced to four problem areas: Rolling or forging, machining, heat treatment, and finishes

HAVING trouble with high strength wrought alloy steel?

You can get a lot of help from the tips given to the SAE at Los Angeles by L. H. McCreery, supervisor of engineering, Chance Vought Aircraft Inc., Dallas:

1. Be sure rolling or forging is done without overheating or burning the metal internally.

2. In machining, watch tears and cuts that are too deep (they produce stress raisers).

3. Make certain the steel you select can be heat treated to high strength yet retain adequate ductility; be sure the treatment is carried out precisely.

4. Watch finishes. A lot of embrittling or cracking can go on underneath.

• **Begin at Beginning**—The internal structure of a steel ingot has a lasting effect upon the physical properties of finished parts. Chance Vought's experts found that out when they first tried using wrought steels with strengths over 220,000 psi. Microstructural banding of aircraft quality steel (as purchased) was not corrected by treatment. (Apparently nothing will break it.)

The answer was to specify certain transverse properties for the guidance of steel producers. Other requirements now include center test minimums and certain macroetch quality limits.

• **Hot Working**—To avoid segregation, it seems to be a good rule to select the smallest ingot which will still allow adequate working in preparing the mill product. The method chosen (rolling, forging, or a combination) isn't as important as

Drop forging techniques must be exceptionally precise. Be sure equipment is adequate. High strength steels quickly show effects of burning or overheating

ingot quality. Chance Vought even tried to show up some differences in closed, vs. flat die forgings but turned up nothing significant. While that's contrary to accepted notions, it does support the ingot quality idea.

When you make forgings that will heat treat to Rockwell 50-53, slight mistakes balloon all out of proportion in the final product. That means shop techniques have to be top drawer to get the most out of the steel.

In one example checked by Chance Vought, a steel forging snapped when the forge shop tried to straighten it even though it had been heat treated to an intermediate Rc 34 prior to machining. Microexamination showed burning and serious overheating. So the forge shop was checked.

Investigators found: 1. Forging equipment was too small for economical production. 2. Flames impinged on billets in the heating furnace. 3. Temperature control was poor. 4. Operators worked at piece rates. 5. Inspection was dimensional only.

It was obvious that the shop used high heat to compensate for the underpowered equipment. With Chance Vought's help, it drastically revised its techniques and produced the parts satisfactorily. But net cost to the aircraft firm came to $100,000.

• **Machining** — Chance Vought gives processors these specifications: 1. Rough machine to 125 rms (maximum), heat treat, and finish. 2. After finishing, heat treat in a neutral salt bath, or a controlled atmosphere with precise control of carbon, or copper plate the part first.

Cuts can't be deeper than 0.006 in. for single point carbide tools, 0.002 in. for grinding.

Why such severe restrictions? Mr. McCreery explains that heat treating turns up a lot of rejects when surfaces are rough (the deeper markings become stress raisers). Also, parts may show a high percentage of static fatigue rejects caused by the heat from heavy cuts which may change surface microstructure into untempered martensite.

Such specifications have led to 100 per cent machining before heat treatment. Naturally, that makes greater demands on heat treat operators.

• **Avoid Distortion** — Chance Vought's forged alloy steel parts range from 3½-ounce pieces to one weighing 78 lb that resembles an outsized wishbone.

The large pieces present a lot of problems in heat treatment. This is the program: Normalize at slightly above usual temperatures; austenitize at slightly below usual temperatures; quench in circulating (not agitated) oil at 160 to 180° F; temper at 400 to 450° F for 4 hours. If copper plating is used, strip and bake at 375° F for 4 hours.

Creepforming is used to hold down distortion within 0.010 in. Parts are held in fixtures during tempering.

Another point you must observe: Apply stress relief to parts after each grinding or machining at full hardness.

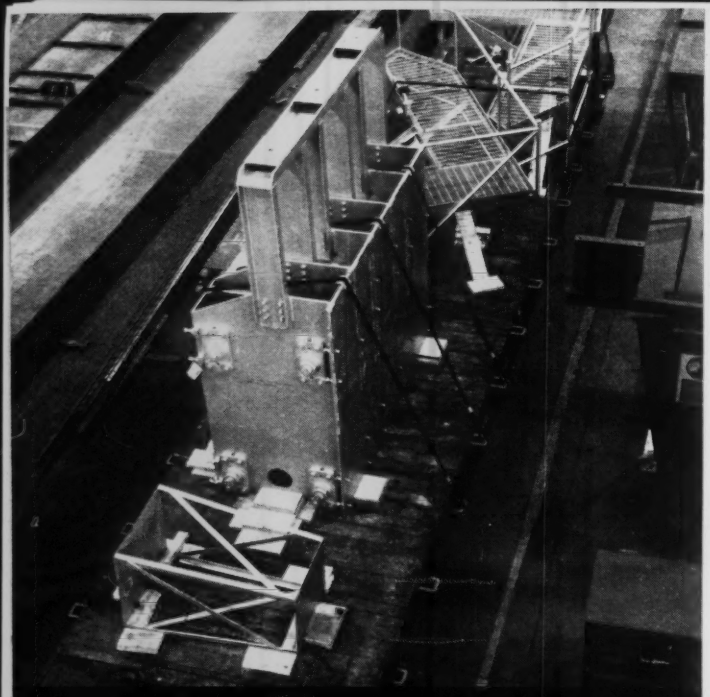
• **Finishing**—High strength steels are exceptionally sensitive to the kind of finish you select. Early attempts to cadmium plate almost always ended with cracking. In spite of continued research, the problems are not fully resolved.

Chance Vought paints 4340 surfaces with a heavy coat of micoaluminum.

• **Adding It Up**—Every Crusader fighter plane contains a lot of 4340 steel in its structure, including the landing and arresting gear. Some parts have seen three years' service.

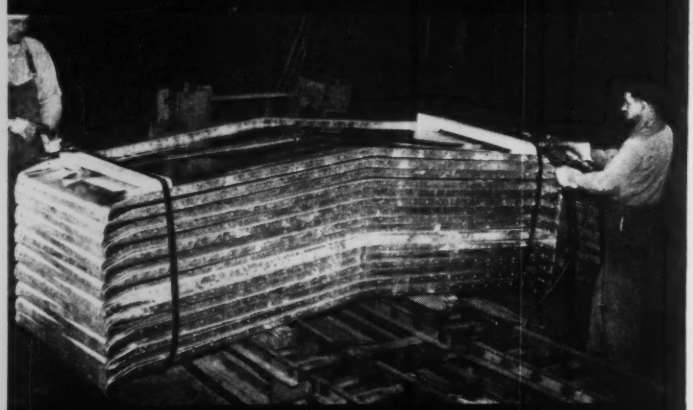
Such experience indicates that properly hardened and heat treated high strength alloy steels more than live up to expectations. All failures have been traced to human error. Parts which fail in crashes or laboratory tests invariably show amazing ductility, refuting the early skeptics who said the material would never be serviceable because it was glass brittle.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.



ACME STEEL **STEEL STRAPPING** secures and protects electric furnace for shipment by flat car. *(Idea No. U2-3)*

ACME STEEL **STEEL STRAPPING** unitizes aluminum ingots for better handling and storage. *(Idea No. U6-16)*



ACME STEEL **STEEL STRAPPING** unitizes steel stampings for easier handling and shipping. *(Idea No. U6-20)*

AIM* for better handling, protection, storage

You can gain important materials handling, protection and storage advantages by applying Acme Steel unitizing and carload bracing Ideas to your operations. Safe, secure packages and shipments result in increased handling speed and labor-materials economies, bringing you important savings and greater customer satisfaction. It's easy to find out how.

Located near your plant is an Acme Idea Man thoroughly experienced in product protection for the primary and fabricated metals industries. He is immediately available to discuss your specific problems and provide hundreds of performance-proved Acme Steel Strapping Ideas, without cost or obligation. The seven Ideas on these pages are included among the Ideas-In-Action Reports your Acme Idea Man will be glad to show you. Among these many Reports—all of which have been developed from actual experiences of dozens of industries—are certain to be Ideas that can be applied to your problems, for better, faster, more economical product handling, protection and storage.

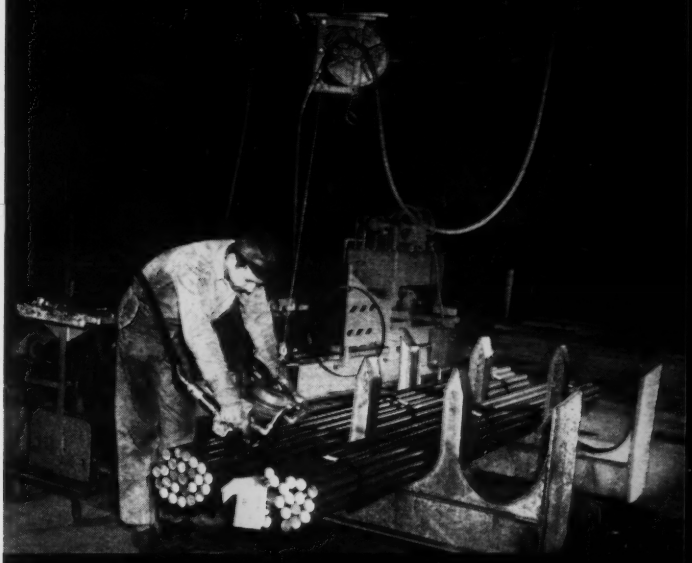
Your *Acme Idea Man can be contacted at the nearest Acme Steel Company office. Simply look under "Steel Strapping" in your classified telephone directory, or send the coupon for full facts and information.

ACME STEEL **STEEL STRAPPING**

ACME STEEL **STEEL STRAPPING** braces loads of wire fencing for safe, secure shipment in gondola cars. *(Idea No. U3-1)*

ACME STEEL **STEEL STRAPPING** machine bundles boxes of kitchen utensils for easier handling. *(Idea No. S2-14)*

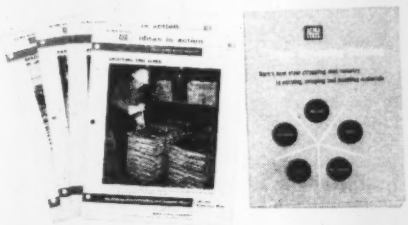
ACME STEEL **STEEL STRAPPING** palletizes heavy wheel and brake assemblies for fast, mechanical handling. *(Idea No. U6-19)*



ACME STEEL **STEEL STRAPPING** applied with pneumatic tools speeds unitizing of cold-drawn steel bars. *(Idea No. U6-18)*

IDEA LITERATURE

Information packed Acme Steel Idea Literature is available to you on request. You can get dozens of clues to better ways to package and protect your products and plant output.



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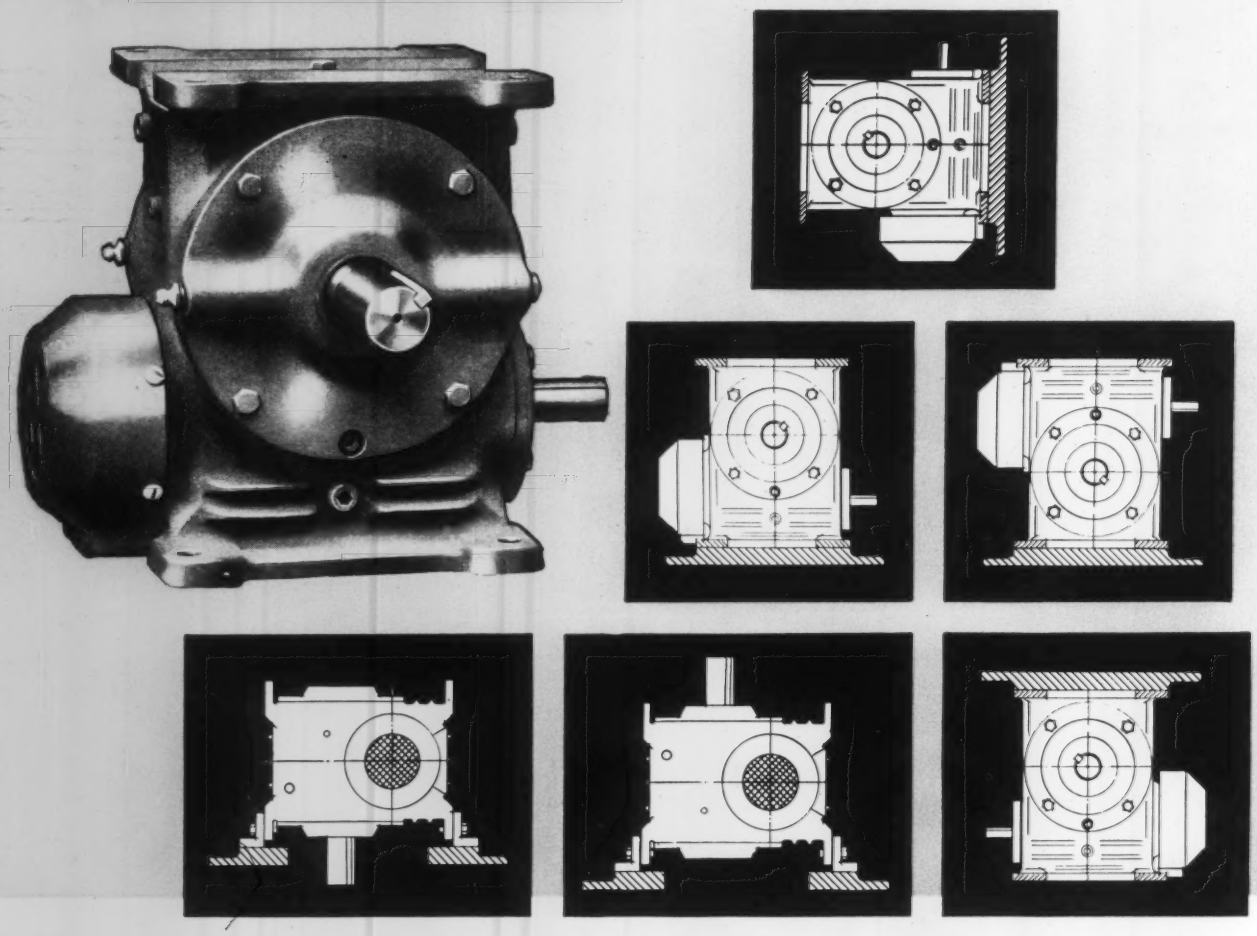

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DE LAVAL *Steam Turbine Company*

860 Nottingham Way, Trenton 2, New Jersey

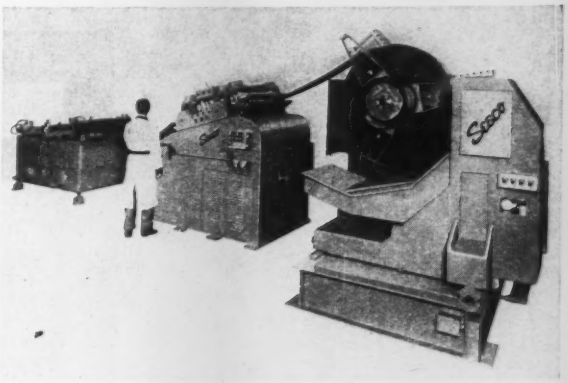
Compact Feed Line Handles High Tonnage Coils

A line for feeding high tonnage coils up to 40,000 lb with 72 in. OD is ruggedly built and compact. It direct feeds blanking, piercing, forming, and progressive die operations.

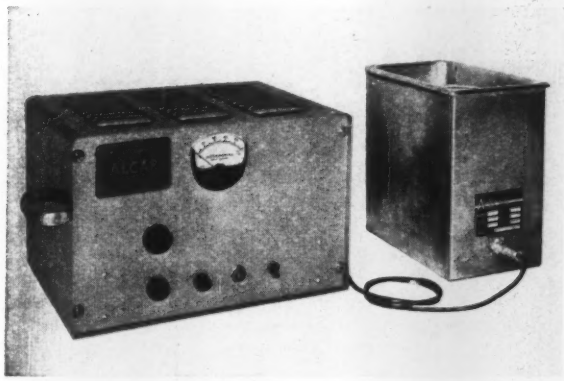
The use of large coils reduces loading downtime.

Expander arms handle any variation in coil ID from 18 to 30 in. without the need for adapters, shims, or other loose pieces. Compact design eliminates the necessity of a pit, and the unit is equipped with a variable speed drive to cover the range of applications.

Lateral and vertical movement of coils is pushbutton controlled, condition and finish of material is protected, and unreeling of stock is smooth and uniform. *Write*: Sesco Inc., 8881 Central Ave., Detroit 4, Mich. *Phone*: Texas 4-1701



Ultrasonic Cleaner Has Variety of Uses



This low frequency ultrasonic cleaner is for small parts and printed circuit cleaning, blind hole washing, removal of radioactive contamination, and other difficult cleaning operations.

The standard unit consists of an electronic generator that delivers 60 watts average (240 watts peak) to crystal transducers on a 1-gallon stainless steel tank.

Two tanks may be used alternately so that one may be used for removing large amounts of soil and the other for final cleaning. This would permit the use of two solutions.

Controls consist of an on-off switch, a frequency adjusting knob, and a switch to operate either transducer. *Write*: Alcar Instruments Inc., 17 Industrial Ave., Little Ferry, N. J. *Phone*: Hubbard 9-3040

Machines Speed Testing of Castings

The narrow saw band of these machines permits an exceptionally fast and efficient slicing of engine blocks and similar parts with complex cores for accurate inspection of such workpieces.

The two units were built for rapid sectioning of all iron, steel, and aluminum castings in general use.

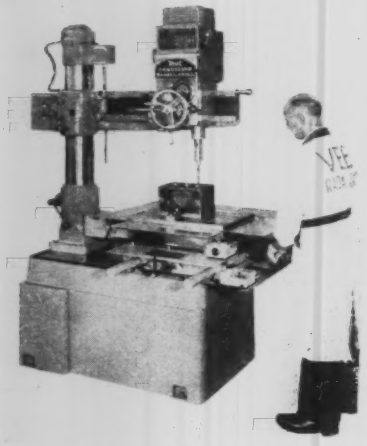
The saw band can be changed when necessary without disturbing the setup. Variable speed transmissions, job selectors, and a wide range of saw guides are incorporated. A smooth, positive hydraulic table feed provides variable rates from 1 in. to 8 ft a minute.

Model 36-2 (shown) has a 25-in. work height and a 48-in. stroke table. A larger model, the 36W, has a 36-in. work height and a 48-in. stroke table. *Write*: DoAll Co., Des Plaines, Ill. *Phone*: Vanderbilt 4-1122

NEW PRODUCTS and equipment

Table Uses No Jigs

A precision spacer table on this company's radial drill produces duplicate parts with a high degree of accuracy without the use of jigs and fixtures.



Any hole pattern can be quickly set up by using micrometers or De-Vlieg Duplitrol bars within a range of 14 to 18 in. with one setting of the drill head.

Working directly from blueprints, hole locations are held to 0.001 in. *Write*: Veet Industries, 25751 Grosbeck Highway, East Detroit, Mich. *Phone*: Prescott 6-3000

Unit Recovers Material

This heavy duty vacuum cleaner is designed for high capacity vacuuming or material recovery. It attaches to any standard open-head 55-gallon drum to provide a 48-gallon dry or 40-gallon wet material capacity.

The unit is powered by a 1¼-hp motor, sealed against dirt and water, that drives a two-stage, turbine-type centrifugal fan. *Write*: Black & Decker Mfg. Co., Towson 4, Md. *Phone*: Valley 3-4400

Rust Prevention Improved

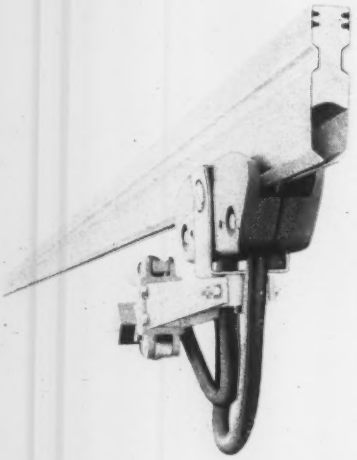
Long lasting rust prevention at low cost is provided by Arrust industrial coating.

It is a fish oil, penetrating-type coating with a rust inhibitor. Easy to apply, it can be used directly over firm rusted surfaces without peeling or flaking.

It can be used as a prime or finish coat. *Write*: Arted Co., 141 W. 53rd St., New York 19, N. Y. *Phone*: Columbus 5-1652

Conductor Is Rugged

Heavy duty applications are handled by the 1000 ampere Hevi-Bar conductor system of mobile electrification. The system meets all straight run requirements and is particularly suited to steel mill cranes or shipyard gantries.



It can be installed as a bare conductor (open) system, or as a safety (closed) system. *Write*: Insul-8-Corp., 1369 Industrial Rd., San Carlos, Calif. *Phone*: Lytell 3-8003

Furnace Provides 3100° F

A protective atmosphere is not needed for the KR-Super, electrically heated high temperature furnace for operation up to 3100° F.

Its rugged steel casing combined with multi-insulation and high-temperature chamber refractory insures long life. An automatic time-temperature run-up provides accurate processing without skilled operators. *Write*: K. H. Huppert Co., 6840 Cottage Grove Ave., Chicago 37, Ill.

Paint Bonded by Coating

Turcoat 4333 is a phosphating material that provides a tight bond for paint and other organic finishes. It is also used in metal drawing.

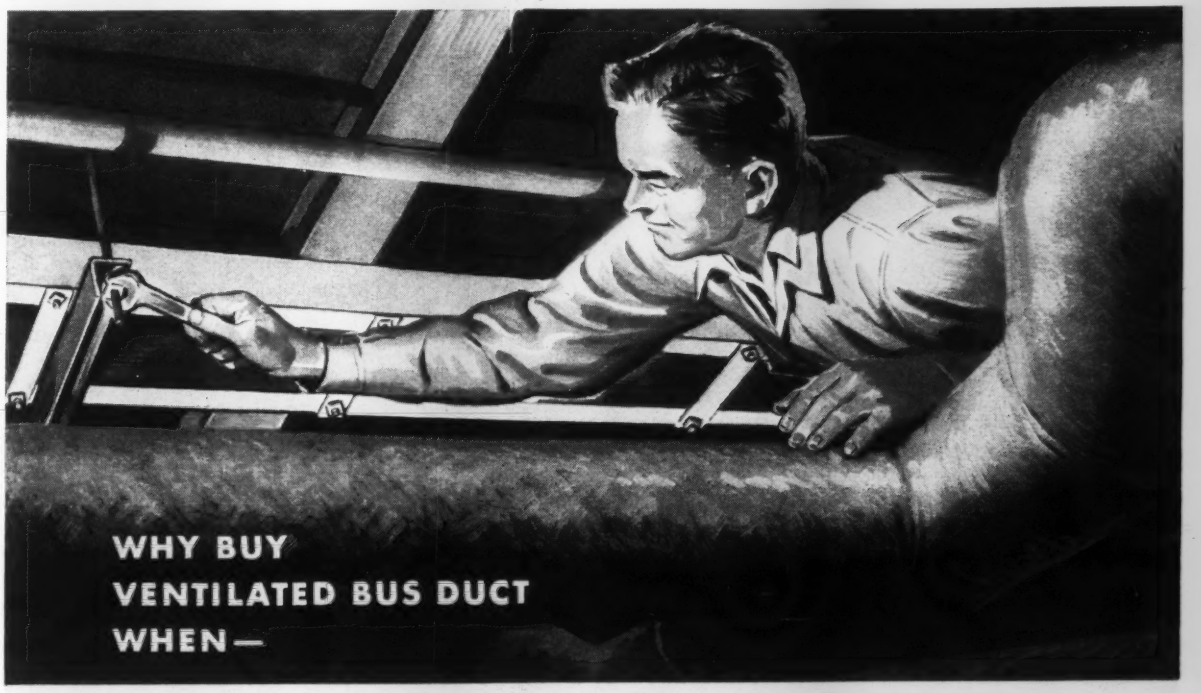
The material deposits a zinc phosphate coating on iron, steel, zinc, and cadmium up to 400 mg per sq ft.

It may be applied by spray washer or immersion. It meets USA-57-0-2C, Type II, Class C and MIL-S-5002 specifications. *Write*: Turco Products Inc., 6135 S. Central Ave., Los Angeles 1, Calif. *Phone*: Adams 2-6111

Table Aids Assembly

Automatic assembly operations which include a press function such as crimping or riveting can be done on the Pressembler. Dial fed secondary press operations in the manufacture of small parts are also possible. The line includes dials up to 18 in. in diameter with 4, 6, 8, or 12 stations on presses with capacities from 5 tons and strokes

(*Please turn to Page* 138)



Square D TOTALLY ENCLOSED Duct*

takes less space—*and costs no more*

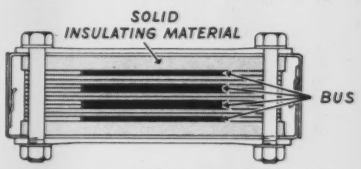
*(low impedance)

Ventilated bus duct is bulky and awkward. It's difficult—sometimes impossible—to install it in restricted areas. The layers of insulation around the bus bars and the necessary air spaces contribute to large, inconvenient size.

Square D totally enclosed feed-in duct solves the space problem. Solid sheets of insulation permit mounting bus bars only ¼" apart. This solid insulating material is also an effective heat conductor, thus eliminating the need for air spaces. The result—Square D low-impedance duct is as much as 50% smaller than ordinary duct. It can be used where no other duct fits. It makes expansion of existing electrical systems easier, new construction planning simpler. Best of all, Square D low-impedance bus duct is totally enclosed. Having no ventilation holes, it's safe from physical damage and dust accumulation. Needing no ventilation, it can be mounted in any position without de-rating.

Doesn't it make sense, when buying feed-in duct, to specify a product that will meet all your requirements? Square D totally enclosed low-impedance duct costs no more—why settle for less?

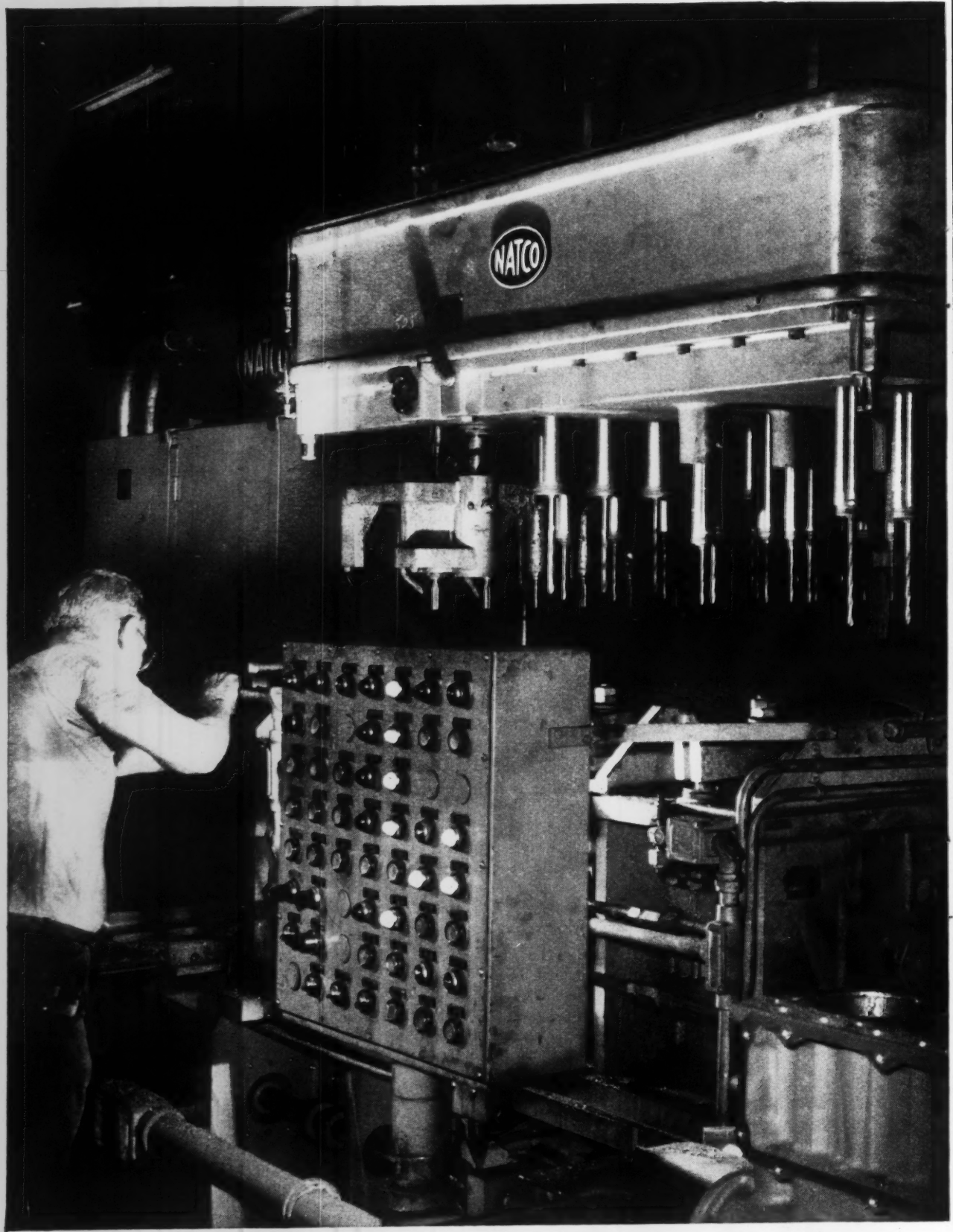
Here's Why Square D's EXCLUSIVE Design makes ventilation unnecessary

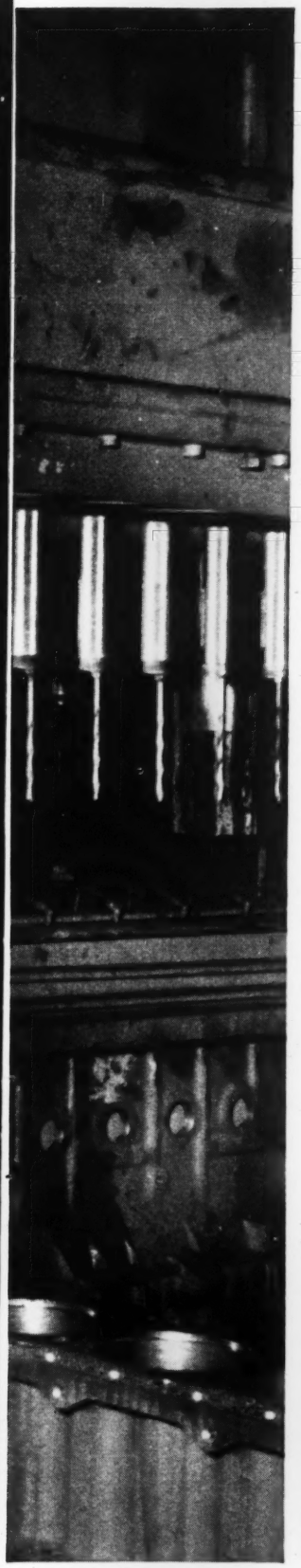


The entire space within the duct and between the bus bars is filled with a solid insulating material which conducts the heat to the surface. There are no dead air spaces inside the duct. Square D totally enclosed low-impedance duct is listed with Underwriters' Laboratories and meets U/L requirements for temperature rise in any mounting position.

EC&M HEAVY INDUSTRY ELECTRICAL EQUIPMENT... NOW A PART OF THE SQUARE D LINE

SQUARE D COMPANY


NATCO



Unique Natco Transfer Machine

One head does the work of four

New Static Control saves space, maintenance

Although it takes up only 125 sq. ft. of floor space, this Natco performs more than 36 operations per minute!

This unique machine combines four working stations under a single compact head — 32″ x 57″, incorporating 31 spindles. Fixture is Natco 6-station straight line index type. With a part in each station, the following operations are accomplished simultaneously:

Station 1: Load Station 2: Drill 7 holes Station 3: Drill 5 holes Station 4: Chamfer 7 holes, drill 5 holes Station 5: Tap 7 holes Station 6: Unload

Used for the first time in a transfer machine, static controls provide a new degree of reliability. Because there are no moving parts, maintenance is virtually eliminated. And this panel occupies 30% less space than conventional controls require.

Combining operations leads to economy — in this case, saved floor space, easier maintenance and all the advantages automation offers.

Call your nearby Natco representative. He can tell you how a Natco can reduce your costs, improve your methods.

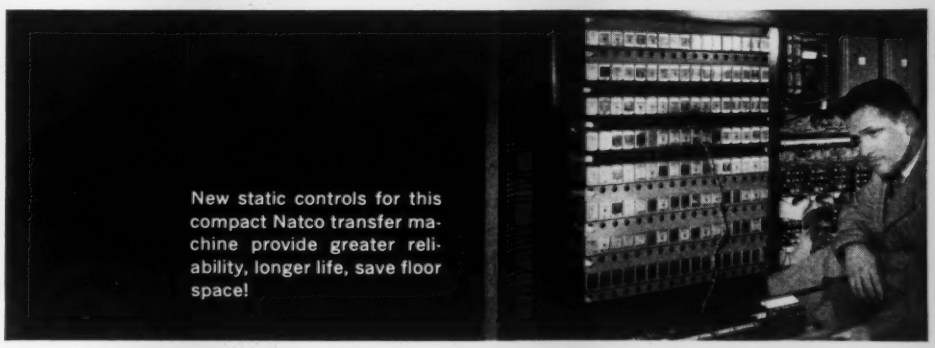
Multiple-spindle drilling, boring, facing and tapping machines. Special machines for automatic production.

NATIONAL AUTOMATIC TOOL COMPANY, INC.

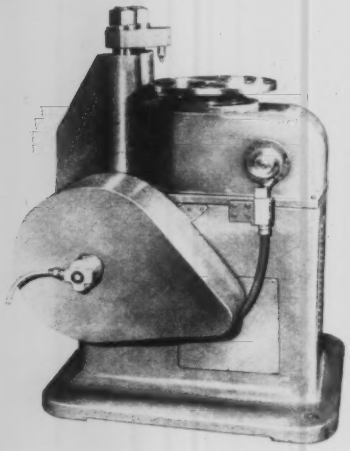
Dept. 305-A, Richmond, Indiana

Natco offices in Chicago, Detroit, Buffalo, New York, Boston, Philadelphia, Cleveland and Los Angeles. Distributors in other cities.

NATCO



New static controls for this compact Natco transfer machine provide greater reliability, longer life, save floor space!



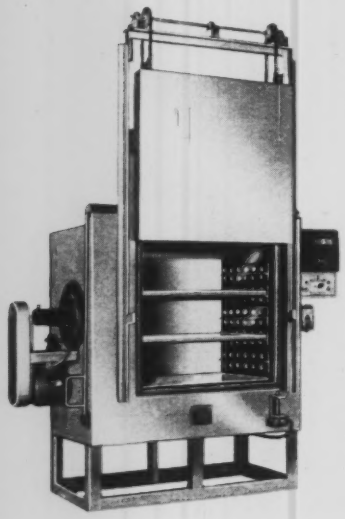
from ½ to 2 in. at speeds over 200 sfpm. *Write*: Ferguson Machine Corp. of Indiana, 7818 Maplewood Industrial Court, St. Louis 17, Mo. *Phone*: Mission 7-5850

Oven Handles New Alloys

These large capacity, high temperature range, recirculating ovens are suited for preheating, stress relieving, and forming techniques, and for heat treating magnesium, aluminum, titanium, and the new alloys.

External thermocouple resistance is automatically proportioned and control pointer shifted closer to point of actuation by the control systems of these Temp-O-Loy ovens.

The ovens meet Air Force Spec. MIL-H-6088A. *Write*: Blue M Electric Co., 138th and Chatham Streets, Blue Island, Ill. *Phone*: Fulton 9-5000



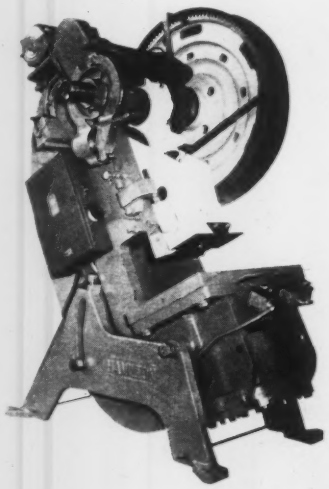
Unit Protects Air System

The Vape-Sorber (a hydrocarbon vapor adsorption device) protects air and gas systems and pneumatically operated mechanisms from oil vapor, free oil, water-oil emulsions, and dirt.

It is available in 14 standard sizes—11 for normal pressure. Three are for high pressure applications. Selas Corp. of America, Dresher, Pa. *Phone*: Mitchell 6-6600

Presses Suit Job Lots

The 75-ton OBI press shown and a 90-ton model are designed for high speed production of small stampings, such as needed in the automotive, electrical, and appliance fields, and by job stampers.

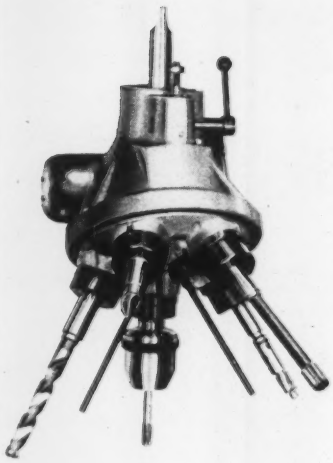


Speed is 40 strokes a minute for the geared version. (Nongeared: 90 strokes a minute.) Inclination from the vertical up to 25 degrees is provided. *Write*: Press Dept., Hamilton Div., Baldwin-Lima-Hamilton Corp., Hamilton, Ohio. *Phone*: Twinbrook 4-6511

Drill Head Ups Output

Any vertical, single spindle drill press can be converted to a multi-spindle unit with the Arbo-3 drill head.

This automatic revolving and indexing head takes two to five tools



at one time, and all spindles are quickly interchangeable.

Drilling capacities are ⅛ to 1 in.; tapping from ⅛ to 15/16 in. *Write*: Jersey Mfg. Co., 453 Livingston St., Elizabeth, N. J. *Phone*: Elizabeth 4-8222

Pushbutton Control

Finger-tip controls facilitate operation of these 9 and 10 in. diameter plate bending rolls.

They quickly produce commercially true cylinders of metal plate up to ¾ in. thick.

Complete, instant control over forward and reverse rotation is provided by a brake-type motor, momentary contact pushbuttons, and oversize magnetic contactors.

The powerful brake stops the rolls instantly on release of buttons, prevents drifting, and provides close control for inching.

The rolls deliver full torque immediately.

A heavy duty, worm gear drive runs silently in a bath of oil; all gears are enclosed. Flat spots in sheets of any thickness are virtually eliminated. *Write*: Niagara Machine & Tool Works, 683 Northland Ave., Buffalo 11, N. Y. *Phone*: Taylor 4070

Bridges Are Removable

Magnesium bridges for connecting plant and warehouse buildings or spanning railroad spurs do not require power operation or counterbalance devices.

They are quickly installed without alterations to existing docks and

A large diameter steel head takes form on one of Claymont's spinning machines—units that turn out heads up to 19 feet in diameter, in ferrous and non-ferrous metals. Integrated facilities make Claymont a reliable source of quality steel plate and plate products for industry

by d'Arazien

CLAYMONT SPUN HEADS

CF&I

CHECK CLAYMONT FOR—Alloy Steel Plates • Carbon Steel Plates • Stainless-Clad Steel Plates High Strength Low Alloy Steel Plates • CF&I Lectro-Clad Nickel Plated Steel Plates • Pressed and Spun Steel Heads • Manhole Fittings and Covers • Fabricated Steel Products Large Diameter Welded Steel Pipe

PRODUCTS OF WICKWIRE SPENCER STEEL DIVISION • THE COLORADO FUEL AND IRON CORPORATION

Plant at Claymont, Delaware • Sales Offices in all Key Cities

5745

"We ought to label this box LOST PROFITS"

Why? Because you lose the original labor cost when any part has to be reworked. Such loss usually exceeds the manufacturing profit. Is "rework" eating into your profits — unnecessarily?

Why accept rework loss?... You don't have to accept this loss as "fixed". The point in production where you spot cracks or defects determines whether you lose both time and labor.

Inspection with Magnaflux during manufacture finds *all* cracks when they first occur suggests the cause and how it can be corrected *before* parts are run in quantity. Magnaflux keeps cracked parts from being machined, holds rework at minimum, reduces loss.

Cracks, whatever the cause, whether from heat treating, grinding ... cleaning, or handling, all run up your labor costs if you don't find them early enough.

Inspection with Magnflux is extremely low in cost, and is fast. Ask to have one of our engineers help you investigate how inspection with Magnaflux may save you money — or write for new booklet on LOWER MANUFACTURING COST.

THE HALLMARK OF QUALITY IN TEST SYSTEMS

MAGNAFLUX CORPORATION

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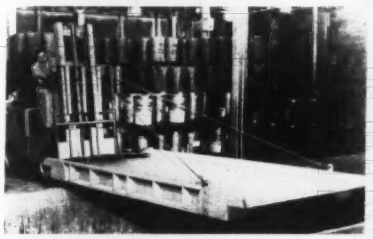
MAGNAFLUX



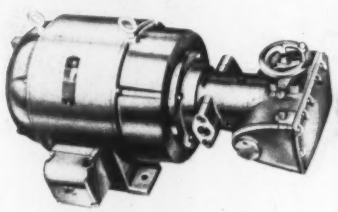
floors, and they can be easily removed for spotting railroad cars.

Lengths range from 10 to 24 ft. Widths are 58 and 70 in., and load capacities are 7000 to 16,000 lb. *Write*: Magline Inc., 1900 Mercer St., Pinconning, Mich.

Units Use Spline Coupling

Spline-coupled hydraulic pump motors in heavy duty frame sizes (364U and 365U) are made for equipment requiring motors through 50 hp.

This spline coupling method provides a direct, pump-to-motor con-



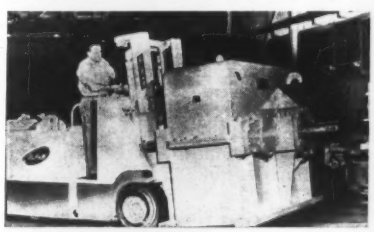
nection. No other couplings are required, and alignment is automatic.

The motors fit all standard make hydraulic pumps. *Write*: Reuland Electric Co., Alhambra, Calif. *Phone*: Cumberland 3-4171

Trucks Take Rough Use

The Titan Series heavy duty electric trucks provide travel speeds over 6½ mph and lift speeds of 31 fpm.

They have capacities from 15,000 to 20,000 lb and can stand rough



(*Please turn to Page* 144)

Ordinary spring and Strippit Hydra-Spring of equivalent force.

equal stripping power in 1/6 the space

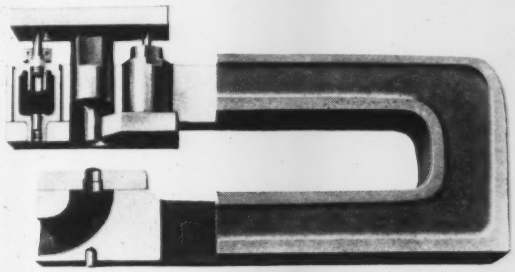
to cut your heavy-duty tooling costs!

Where high stripping pressures are required due to size and type of work or thickness of stock, Strippit Hydra-Springs are the answer. Utilizing the compressibility of liquids, Hydra-Springs develop up to six times the force of equivalent mechanical springs, greatly reducing the number, travel and size of stripping units required.

Impressive economies through Strippit flexible multiple-unit press setups

Like the Strippit, the Hydra-Spring is used in the Strippit line of independent, self-contained, self-stripping punching units. This is the tooling system that breaks the time and cost barriers of fixed perforating dies by permitting simple bench assembly setups . . . all but eliminating press down-time whether it's a long production run, a pilot run for design changes or a "repeat" run later on. No burring necessary, of course.

WHATEVER YOUR PIERCING OR NOTCHING APPLICATION, don't miss the major savings so many industries are enjoying with flexible Strippit tooling. Write today for full details, and if you wish, a demonstration at your plant by a mobile Strippit unit.



Using Hydra-Springs for the heaviest duty work, the Strippit line of hole punching units offers a complete range of capacities up to ¾" in mild steel. A full stock of quick-change standard tools or "specials" made to your order. Warehouse stocks in Chicago and Los Angeles.

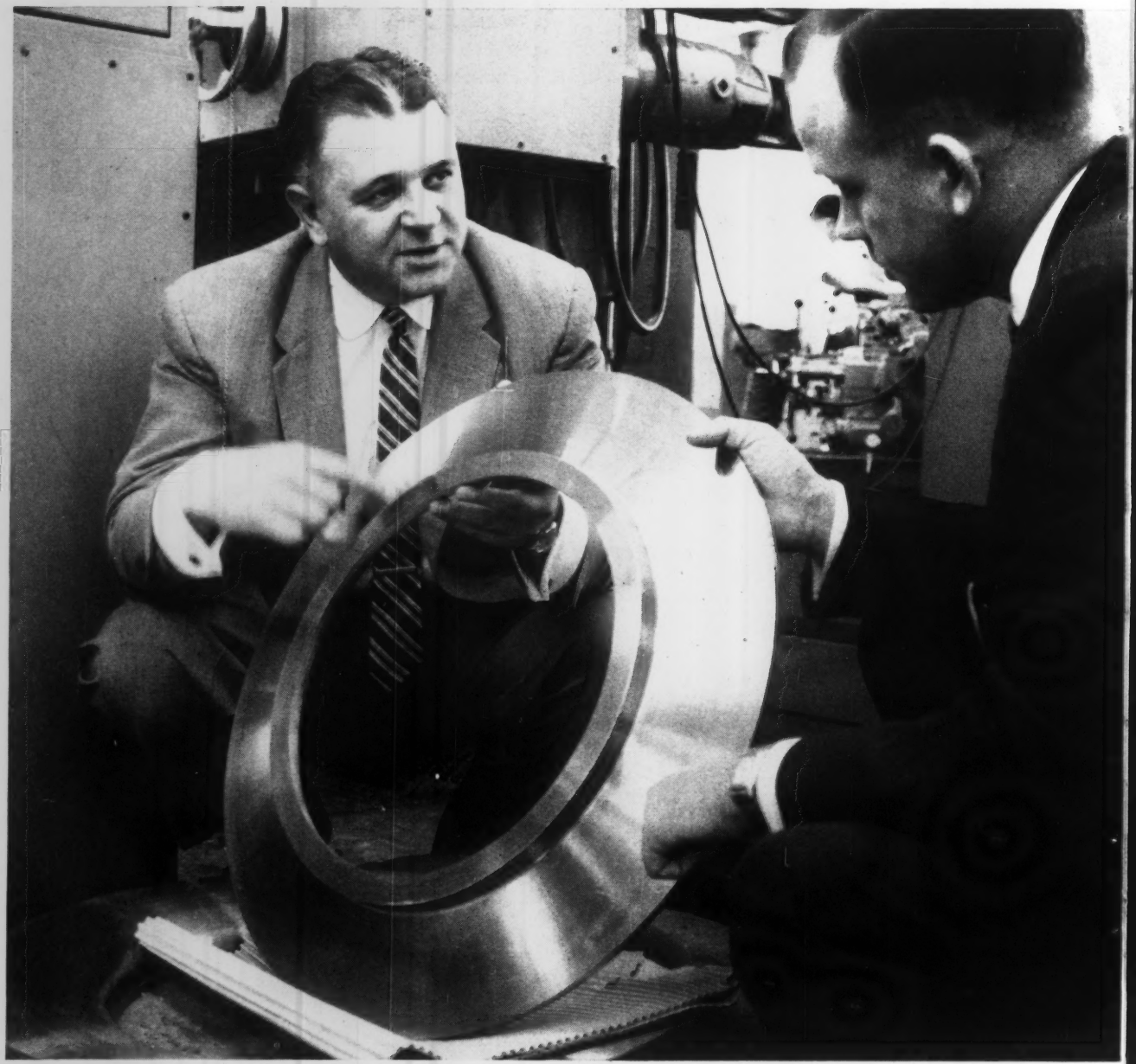
WALES STRIPPIT COMPANY

210 Buell Road • Akron, New York

A UNIT OF HOUDAILLE INDUSTRIES INC

Manufactured in Canada by Strippit Tool and Machine Limited, Brampton, Ontario

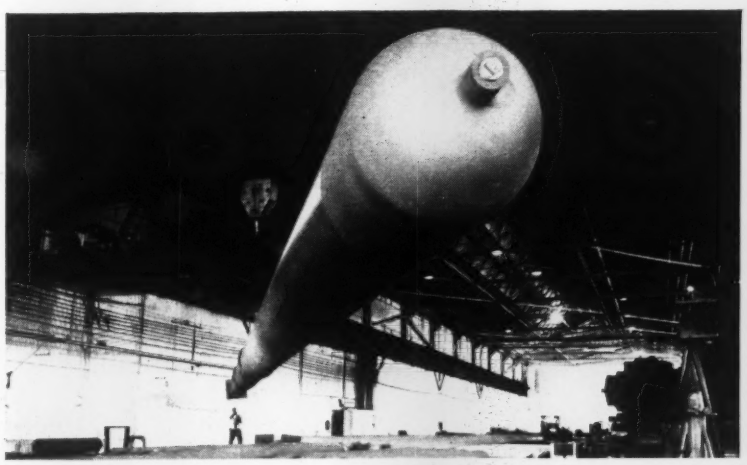
When you buy from U. S. Steel



STEEL + PLUS IN ACTION: TECHNICAL ASSISTANCE

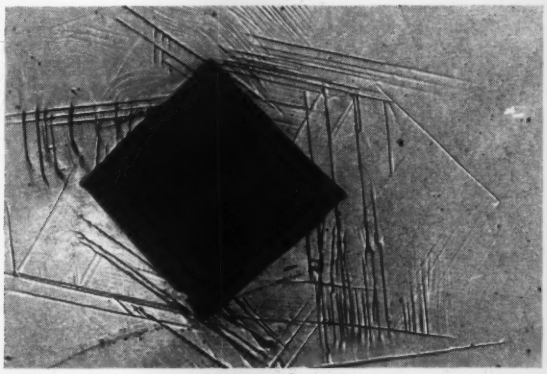
The impeller for a centrifugal gas compressor whirls at speeds up to 6,000 rpm., and is subjected to tremendous stress. The Cooper-Bessemer Corporation previously made impellers from a type of steel that was hard to weld. A USS metallurgist suggested "T-1" Constructional Alloy Steel. It has a phenomenal 100,000 psi yield point, and can be welded by ordinary methods, *without* pre-heating or stress relief. The new "T-1" Steel impellers are easier to fabricate and they can withstand 115% more stress than designed for. Shown here with a "T-1" Steel impeller part are Mr. W. McCracken, right, the Chief Metallurgist of The Cooper-Bessemer Corporation, and J. M. Trutz, USS Service Metallurgist.

you get STEEL + PLUS



STEEL + PLUS IN ACTION: FACILITIES

This blimp-like cylinder is headed for an oxygen plant in Illinois. Thirty of these 80-foot giants were made at U. S. Steel's National Tube Division, Christy Park Works, McKeesport. Similar seamless cylinders, with walls up to 3" thick, are able to contain pressure of 10,000 psi. They were practically unheard of until a few years ago when National Tube developed them to meet the demands of new, high-pressure requirements.



STEEL + PLUS IN ACTION: RESEARCH

The black square on this photomicrograph is the impression made by a diamond-tipped penetrator when it was pressed into a crystal of age-hardened steel. The lines and ripples were caused when layers of atoms slipped and wrinkled around the penetrator. U. S. Steel researchers study the patterns in such micrographs to learn what happens atomically when steel is bent, flexed or broken. This helps us to develop new and better steels.

STEEL + PLUS IN ACTION: MARKETING ASSISTANCE

Automobile manufacturers use Stainless Steel for much of the trim on new models. Because it's Stainless, the trim *stays* sparkling bright—a point that means a lot to new car buyers. To help promote this feature, U. S. Steel prepared posters showing where Stainless is used on various makes of cars, and sent these valuable sales aids to 60,000 auto dealers.

USS and "T-1" are registered trademarks

American Bridge • American Steel & Wire and Cyclone Fence • Columbia-Geneva Steel • Consolidated Western Steel
National Tube • Oil Well Supply • Tennessee Coal & Iron • United States Steel Homes • United States Steel Products
United States Steel Supply and Gerrard Steel Strapping • Universal Atlas Cement • United States Steel Export Company

USS **United States Steel**

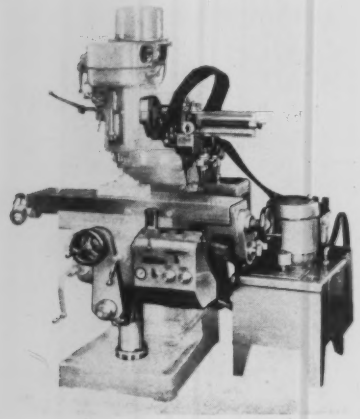
operation in steel mills and foundries.

The Tri-Safe braking system incorporates three completely independent brakes. *Write*: Elwell-Parker Electric Co., 4205 St. Clair Ave., Cleveland 3, Ohio. *Phone*: Utah 1-6200

Tracer Controls Miller

The Synchro-Trace system for diesinking and moldmaking is adaptable to all makes of milling machines.

It allows the mill to be used conventionally or as a fully automatic machine. The automatic feature saves 90 per cent operator time.



Similar systems are adaptable to lathes, boring mills, and vertical turret lathes. *Write*: Dept. SM, True-Trace Sales Corp., P. O. Box 3307, El Monte, Calif. *Phone*: Cumberland 3-4761

Product Aids Welding

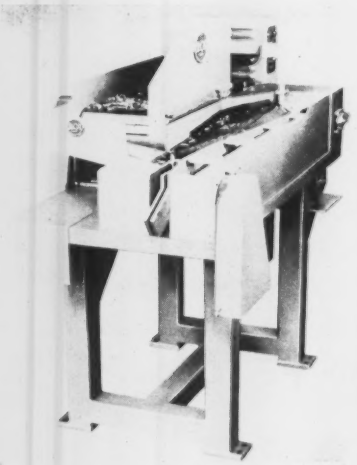
Repeat cleaning of steel joints for welding is eliminated with Weldaluminite. It acts as a weld deoxidizer and deporosite and does not need to be removed before welding.

Its use results in grain refinement and arc stabilization, making it possible to arcweld rimmed steels with the ease and soundness of expensive killed steels.

The product protects prepared joints and grooves from rust, and inhibits the rusting of newly welded seams. *Write*: Spelaluminite Co., 100 S. Walter St., Ossining, N. Y.

Feeds Fragile Parts

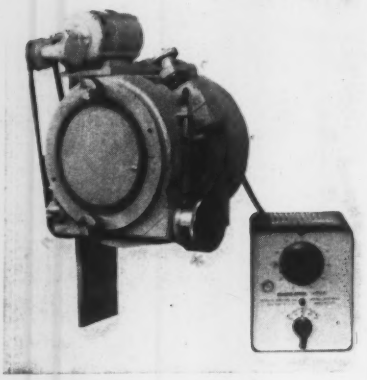
The Model 330-NM Non-Mar Feeder automatically orients and feeds fragile parts at speeds up to 30,000 pieces an hour. It will handle flat, round discs or rings, cylindrical or rectangular shapes.



A Demand-Feed control assures smooth, continuous flow of parts. *Write*: Radio Corp. of America, Industrial Automation Equipment, 12605 Arnold Ave., Detroit 39, Mich.

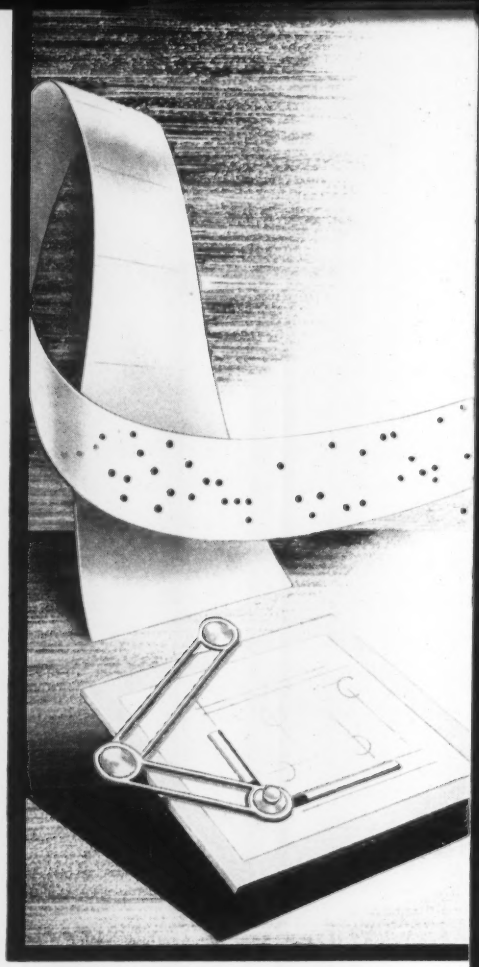
Measures Coil Feed

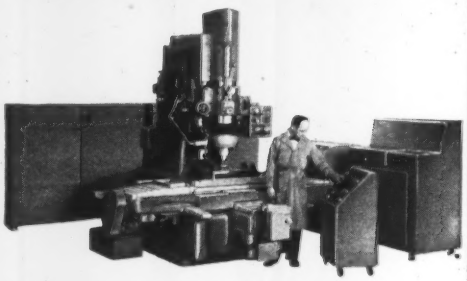
This quick-change measuring device is used on long or short, motorized coil feeding machines. Feed length can be changed from 0 to



180 in. or more in 30 seconds while equipment is in motion.

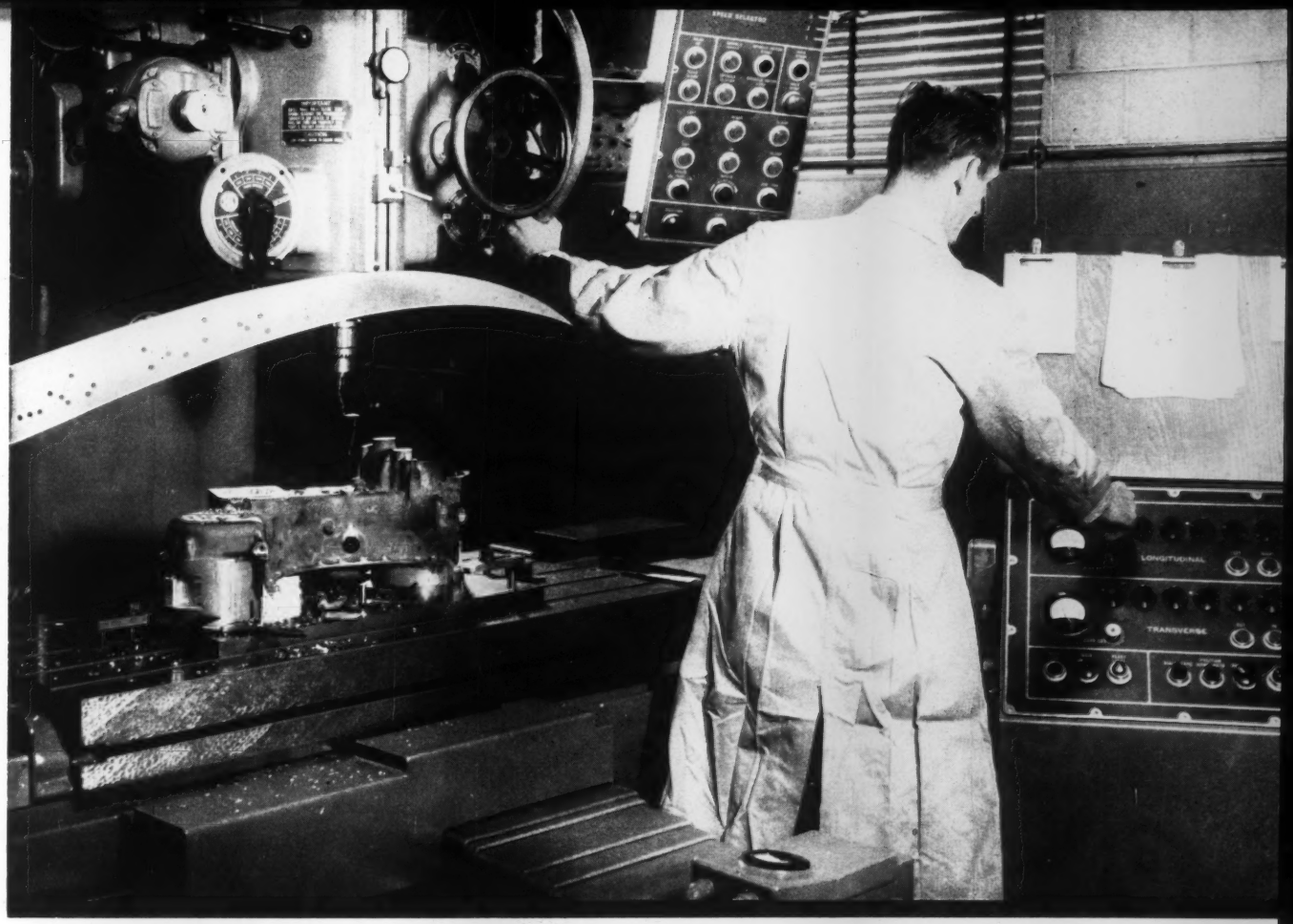
A micrometer dial provides accurate settings. *Write*: Automatic Feed Co., P. O. Box 391, Napoleon, Ohio. *Phone*: 6951





OTHER P&W NUMERICALLY CONTROLLED MACHINE TOOLS

. . . include the No. 2E Vertical Precision Hole Grinder and the 42" Precision Rotary Table.

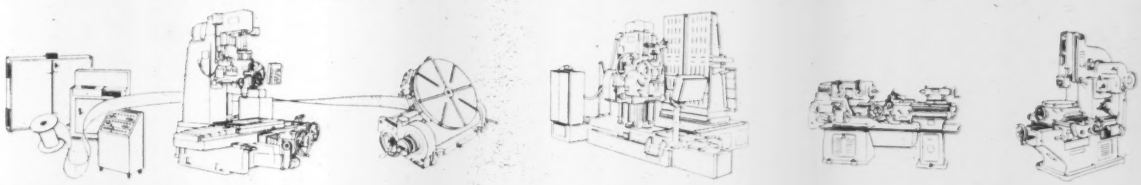


PRECISION JIG BORING TIME CUT 90% . . .

. . . **WITH P&W NUMERICAL CONTROL!** Precision work put on *predictable* production schedules, completed in as little as 1/10 the time required by previous methods. Costly human errors are eliminated. Positioning accurate to "tenths" absolutely guaranteed. These benefits are reported by Dexter Tool Company of Hazel Park, Michigan, since installing a Pratt & Whitney Numerically Controlled Jig Borer. Dexter produces precision aircraft and automotive components. Work involves 6 to 50 identically machined parts, and it's important to guarantee precision, accurately estimate production time and deliver on schedule. Positioning itself automatically by punched tape, the Numerically Controlled Jig Borer handles "tenths" limits as fast and surely as ordinary work. A Dexter spokesman states, "We think the P&W 2E Numerical is the greatest single improvement in machine tooling. It's the ultimate."

Today, "tenths" limits are common, yet profitable operation demands that you produce faster than ever before. Pratt & Whitney Machine Tools with Numerical Control can provide the right answer for you!

Write now for complete information.
Pratt & Whitney Company, Inc.
13 Charter Oak Boulevard, West Hartford, Conn.

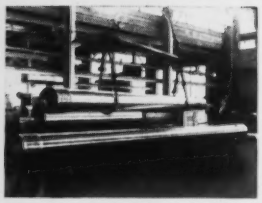


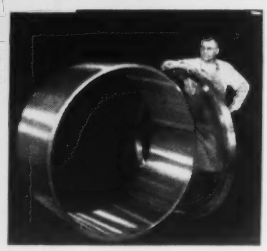
NUMERICAL CONTROL . . . JIG BORERS . . . ROTARY TABLES . . . KELLER MACHINES . . . LATHES . . . VERTICAL SHAPERS

PRATT & WHITNEY

FIRST CHOICE FOR ACCURACY

MACHINE TOOLS • GAGES • CUTTING TOOLS





Your parts last longer when they're

SHENANGO CENTRIFUGAL CASTINGS

Your machine parts, ferrous or non-ferrous, are subject to stress, strain and friction, day after day, year after year . . . so specify Shenango . . . and see what a difference this makes!

Shenango's centrifugal casting process insures longer life because of finer, more uniform, *pressure-dense* grain to begin with . . . free of inclusions, porosity, blowholes and other weakening defects. Then, far less machining is needed and your part is stronger . . . to last and last *and last!*

Shenango's modern and fully-equipped shops will supply you with ferrous or non-ferrous symmetrical parts in virtually any shape or size . . . rough, semi-machined or precision-finished to your most exacting specifications. For full details, write: *Centrifugally Cast Products Division,* The Shenango Furnace Company, Dover, Ohio.

SHENANGO CENTRIFUGAL CASTINGS

COPPER, TIN, LEAD, ZINC BRONZES • ALUMINUM AND MANGANESE BRONZES
MONEL METAL • NI-RESIST • MEEHANITE METAL • ALLOY IRONS

NEW literature

Write directly to the company for a copy

Anodizing Aluminum

An analysis of anodizing conditions, film qualities, racking, handling current surges, tank design, temperature control, cleaning, bright dipping, coloring, and sealing are set forth in a paper. Frederic B. Stevens Inc., 1800 18th St., Detroit 16, Mich.

Tracer Lathe

The Model 14T Multi-Cycle hydraulic tracer lathe is described in a circular. Sundstrand Machine Tool Co., 2531 Eleventh St., Rockford, Ill.

Fork Truck

A bulletin gives operating and design specifications of Model F-45T3, a 3000-lb capacity, electric powered fork truck. Elwell-Parker Electric Co., 4205 St. Clair Ave., Cleveland, Ohio.

Battery Chargers

A revised data sheet is available on selenium and silicon rectifier station-type battery chargers for industrial operations. Syntron Co., 370 Lexington Ave., Homer City, Pa.

Check Valves

A brochure describes improved Kep-O-Seal spring loaded, hydraulic, and pneumatic check valves. They are tested to withstand great shock and retain positive tightness against leaks. Kepner Products Co., 7301 W. 59th St., Box 407, Summit, Ill.

Power Strapping

A powered assembly that feeds steel strapping around large packages at the rate of 4½ fps is described in a folder. Acme Steel Co., 135th Street and Perry Avenue, Chicago 27, Ill.

Stainless Tubing

Bulletin 415 explains how welded stainless steel heat exchanger and condenser tubes are made. Fabrication and service advantages of fully annealed tubing are cited. Tubular Products Div., Babcock & Wilcox Co., Beaver Falls, Pa.

Conveyors and Systems

Unibilt power and gravity conveyors are described in a bulletin. Assemble-yourself construction is explained. Conveyor Specialty Co. Inc., 33 Newport Ave., North Quincy 71, Mass.

Shipment Addressing

A booklet shows how to save time and money with assembly line shipment addressing—without expensive equipment. Weber Marking Systems, 215 E. Prospect Ave., Mt. Prospect, Ill.

Stationary Batteries

Bulletin CP-540 covers use, design, and construction of PlastiCal lead-calcium grid batteries. A life expectancy of 25

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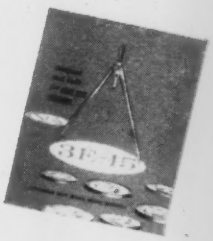
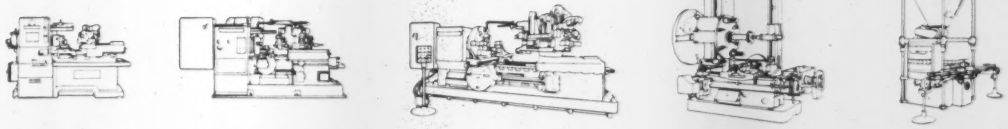




AUTOMATIC TURRET LATHES . . . GEAR CUTTERS . . . PACKAGING MACHINES

POTTER & JOHNSTON

SUBSIDIARY OF PRATT & WHITNEY COMPANY, INC.

PRECISION PRODUCTION TOOLING SINCE 1898

NEW LITERATURE . . .

years is claimed in control, switchgear, auxiliary power, and other stationary applications. C & D Batteries Inc., Washington and Cherry Streets, Conshohocken, Pa.

Thread Rolling

The Lanhyrol thread rolling machine which features four methods of rolling workpieces 3/16 to 3 in. in diameter is described in a bulletin (E-60). Landis Machine Co., Waynesboro, Pa.

Barrel Finishing

Tumbling Media for Barrel Finishing, 20 pages, is based on laboratory and factory case studies. It is a practical handbook for supervisors and operators. Discussed are kinds of tumbling media; types of applications; types, functions, fixturing, and linings for tumbling barrels; compounds and cleaners, do's and don'ts concerning water, and analyses of typical jobs. Electro Minerals Div., Carborundum Co., Niagara Falls, N. Y.

Aluminum Idea Kit

This kit, containing a sample lot of extruded aluminum shapes, is intended to suggest ideas to a product designer. It offers him possible shortcuts in production, attachment with a minimum of fastenings, product simplification, and decorative trim, Midwest Aluminum Corp., 7696 W. Michigan Ave., Kalamazoo, Mich.

V-Belt Life

How to Get Longer Life from V-Belt Drives tells how to select and install V-belts, diagnose belt failures, and how to detect and correct troubles. Tips for proper maintenance and a suggested inventory survey are included. B. F. Goodrich Industrial Products Co., Akron, Ohio.

Hydraulic Cutting Tools

A 70-page catalog lists special purpose high thrust hydraulic cutting tools. Sections cover material to be cut, including wire, rods, steel billets, strip, bars, and tubes. Thrust data charts cover punching and riveting. Recommendation charts for cutting mild, high carbon, and alloy steel are included. Manco Mfg. Co., Bradley, Ill.

Universal Tester

A brochure has been issued which lists specifications and prices on the Low Range Universal Tester, a small motorized laboratory instrument that accurately makes tests in tensile, compression, transverse, and shear on any low strength industrial material. W. C. Dillon & Co. Inc., 14260 Keswick St., Van Nuys, Calif.

Welded Steel Tubing

Seamless and electric-resistance welded steel tubing in mechanical, aircraft mechanical, airframe, and pressure grades is described in Catalog CS-59. Ohio Seamless Tube Div., Copperweld Steel Co., Shelby, Ohio.

Lift Truck

The 24-volt Model MN electric tiering truck (rider type) for narrow aisle use is described in Circular 35K. It is available in 2000 or 3000 lb capacities. Dept. R8-22, Lewis-Shepard Products Inc., 125 Walnut St., Watertown 72, Mass.

Speed Reducers

Shaft-Mounted Speed Reducers, Book 2618, contains engineering and selection information on single and double reduction drives. They can be mounted at angular or horizontal positions. Link-Belt Co., Prudential Plaza, Chicago 1, Ill.

Rare and Reactive Tubing

Information on rare and reactive metal tubing for the nuclear and missile fields is covered in a 44-page handbook. Damascus Tube Co., Greenville, Pa.

Magnesium in Electronics

The use of magnesium in airborne and air-transportable electronic equipment is described in *Magnesium in the Electronics Industry*. Dow Chemical Co., Midland, Mich.

Hard Surfacing

A hard surfacing fact file gives data on the Murex line of 88 types and sizes of Hardex hard surfacing electrodes and rods. Metal & Thermit Corp., Rahway, N. J.

Magnetic Rubber

Denmag magnetic rubber applications are described in Bulletin No. 58. The material is flexible, resistant to oils and acids, and is available in molded or sheet form. Denman Rubber Mfg. Co., Warren, Ohio.

Special Production Tools

Multiple operation tools that combine two or more related boring, facing, chamfering, and reaming operations in one setup are covered in Bulletin No. S-19. McCrosky Tool Corp., Meadville, Pa.

Carbide Products

Cemented carbide products with prices and quantity extra table data are covered in Catalog No. 59. Described are Kendex tools and boring bars, standard blanks, brazed tools, clamped inserts and Kennamills. Dept. 59, Kennametal Inc., Latrobe, Pa.

Milling Machine

Specifications and applications of the Sundstrand C1 Mechanical Feed Rigidmil are detailed in a brochure. Sundstrand Machine Tool Co., Rockford, Ill.

Rebuilt Machinery

A catalog describes used and rebuilt metalworking machinery of all sizes and types. Interstate Machinery Co. Inc., 1431 W. Pershing Rd., Chicago 9, Ill.

NEW BOOKS

Electrodeposited Metallic Coatings, American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. 124 pages, $2.25

This compilation of ASTM standards covers electrodeposited zinc, cadmium, nickel, chromium, and lead for steel. Coatings for copper, copper-base alloys, zinc, and zinc-base alloys are also discussed. Included are local thickness, acetic acid, and salt spray tests, and recommended practices for preparing metals for plating. This edition supersedes the 1955 edition.

Powder Metallurgy in Nuclear Engineering, under direction of Dr. Henry H. Hausner, American Society for Metals, Book Dept., Cleveland 3, Ohio. 275 pages, $8.50

This volume should prove of major reference value to engineers and students of the advanced stages of metal technology. Its 15 chapters range from general metallurgical problems in the design of nuclear reactors through the safe handling of pyrophoric and radioactive metal powders. Powder metallurgy of zirconium, uranium, thorium, beryllium, and various alloys are discussed, as are metal powders, preparation for reactors, ceramic fuel materials, and related topics. Most of the work and findings were under AEC sponsorship.

Technology of Columbium (Niobium), edited by B. W. Gonser and E. M. Sherwood, John Wiley & Sons Inc., New York 16, N. Y. 120 pages, $7

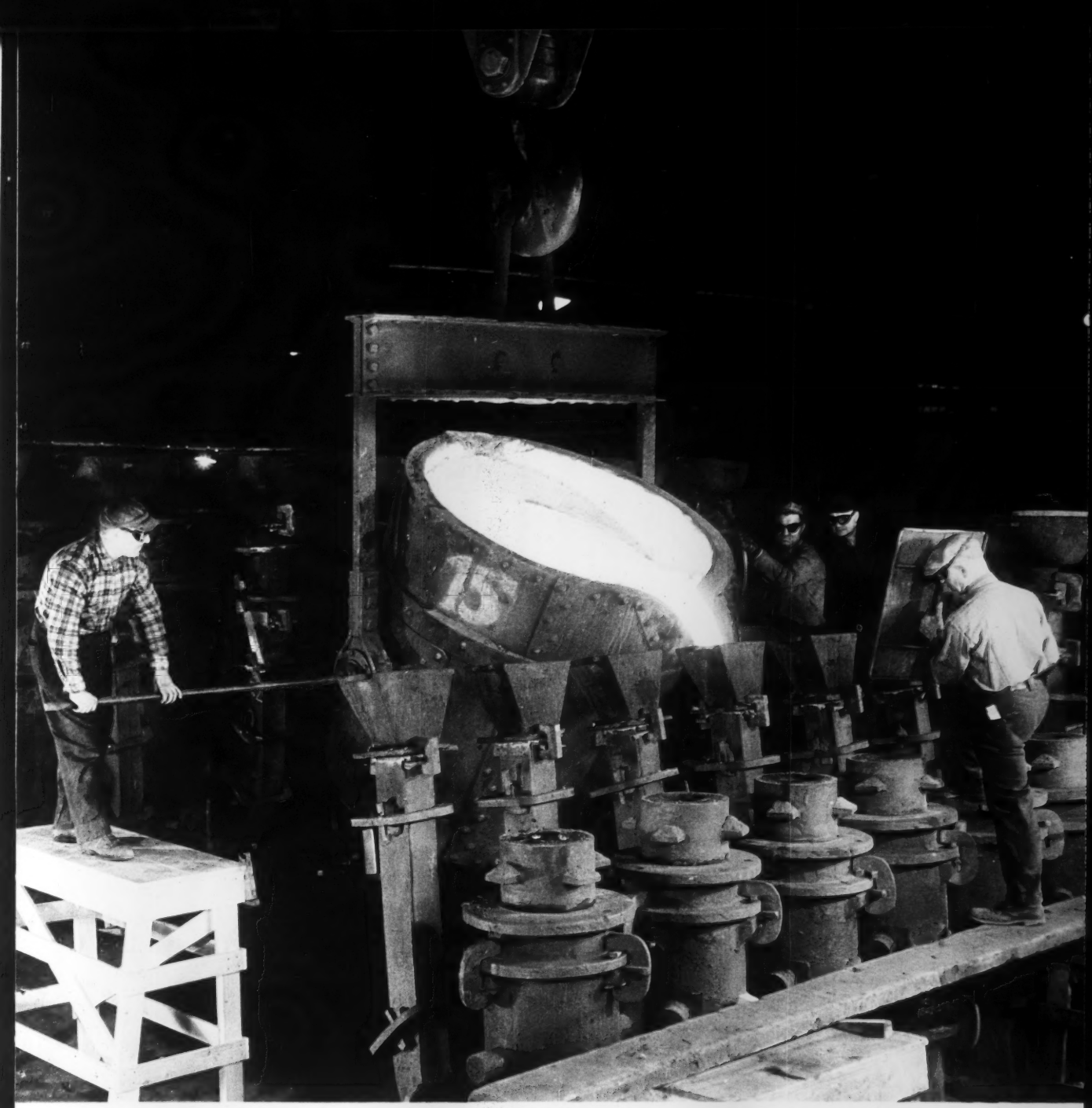
Acting on a suggestion made by I. E. Campbell, of the Battelle Memorial Institute, the Electrothermics and Metallurgy Division of the Electrochemical Society planned a symposium on columbium. This was presented at the 111th meeting of the society at Washington, D. C., May 12-16, 1957. This volume is a compilation of most of the papers of the symposium. The work covers a review of properties, the supply situation, extractive process metallurgy, analysis, effect of gases, alloy studies, and related subjects.

Annealing of Low Carbon Steel, Lee Wilson Engineering Co. Inc., Cleveland, Ohio. 138 pages, $7.50

The entire proceedings of the International Symposium on the Annealing of Low Carbon Steel held at Case Institute of Technology, Oct. 29 and 30, 1957, are covered in this volume. Each paper presented is reproduced in its entirety.

Directory of New England Manufacturers, 1959, editorial co-operation of The New England Council, George D. Hall Co., Boston 9, Mass. 790 pages, $45

This directory lists about 14,000 manufacturers of all sizes and types throughout the six New England states (Maine, New Hampshire, Vermont, Massachusetts, Connecticut, and Rhode Island). The volume is divided into four sections: Alphabetical, geographical, product, and brand name.



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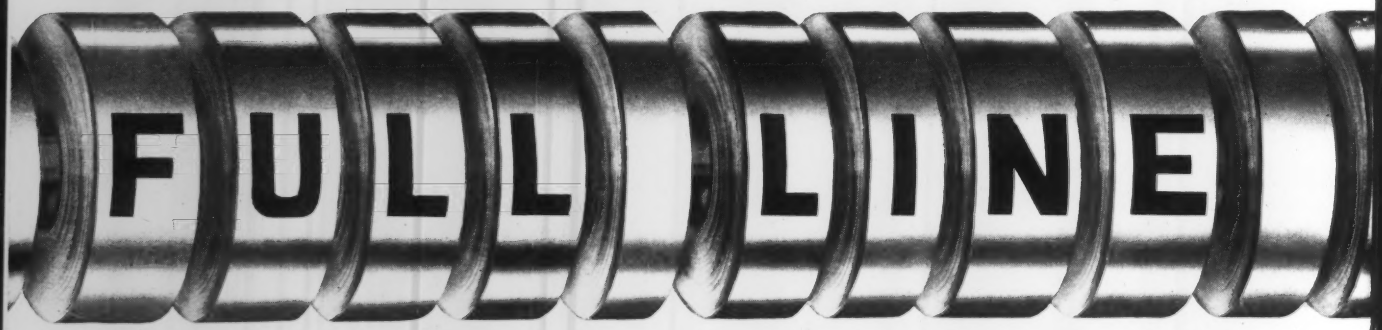

Let's examine this "Full Line" product list of cold rolled strip steel. At J&L it includes all carbon grades, coated and uncoated, alloy, stainless and tempered spring steel. It offers all thicknesses from .001" or less to .156" or more, in widths from 1/4" to 24"—and tolerances for gauge and width closer than standard when required. There are "Full Line" advantages, too, in a range of controlled tempers and structures possible only with the variety of annealing, heat treating and rolling processes found at J&L.

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STEEL CORPORATION
STAINLESS and STRIP DIVISION
YOUNGSTOWN 1, OHIO

Market Outlook

Automakers Boost Production Plans

NEW CARS are selling so well that automakers are scheduling maximum output for the rest of the year. Retail deliveries took such a jump during the first ten days of the month that Detroit boosted its November production goal from 531,000 to 590,000. Next month, the industry hopes to turn out 600,000 cars, 90,000 more than it planned originally. If the revised quotas are met, fourth quarter production will be about 1.45 million cars, the total scheduled before strikes cut October's output.

Although those plans may sound ambitious, the automakers won't be strained unless the white-collar strike which began at Chrysler Corp. last week is prolonged. They assembled 567,000 cars last December and 682,000 in December, 1955. During a record month (March, 1955), they built 794,000. Anticipated production for the fourth quarter is below the average for that period in recent years.

BIGGER ORDERS FOR STEEL?—There's been little change in automotive demand, but mills are glad to be getting the releases that were held up by labor disputes. Some steelmakers think they'll get supplementary orders. Chicago mills report that they're being asked to deliver additional tonnages of sheets and bars in November and December.

BACKLOGS INCREASE—Supported mainly by customers in the automotive, construction, appliance, container, and agricultural equipment industries, steel producers are accumulating sizable backlogs. A midwestern mill says its bookings are at the highest point of the year, 65 per cent greater than they were six months ago.

GALVANIZERS SET PACE—Aided by good construction weather, higher farm income, and a tendency toward inventory building, galvanized sheet manufacturers are operating close to capacity. Their 1958 shipments are sure to exceed last year's 2,375,420 tons. During the first nine months, they shipped 2,018,310. Assuming a 750,000-ton fourth quarter, the year's total will be 2,768,310. The record year was 1956, when 2,957,991 tons were shipped. Many producers are booked through January. Chicago mills have such big backlogs that they're losing business to eastern steelmakers who can provide December delivery.

STAINLESS BRIGHTENS—Stainless steel shipments won't set any records this year, but producers think their prospects are improving (see Page 153). They shipped more metal in September than they did in June, when customers were hedging against an expected price increase. Shipments of 347,067 tons were recorded during the first nine months, and it's believed that the year's total will be about 480,000 tons (vs. 490,195 in the first three quarters of 1957). Next year, producers look for a 30 per cent increase. They're pinning their hopes on greater consumption by the automotive and appliance industries.

HEAVY PRODUCTS GAIN—November is shaping up as one of the better months for plates and structurals. Among major consumers, only the railroads and pipe manufacturers are failing to increase their orders. Standard structurals are remarkably strong in the absence of a carbuilding program. Demand for wide flange beams is nearly as good as it was in May and June. "With any luck, we'll beat last month's shipments by 10 per cent," a leading producer reports.

PRODUCTION HITS '58 HIGH—Last week, steelmakers boosted their operations 1 point to 75.5 per cent of capacity, the highest rate of the year. Production was about 2,038,000 net tons of steel for ingots and castings, the largest of any week since Nov. 3, 1957.

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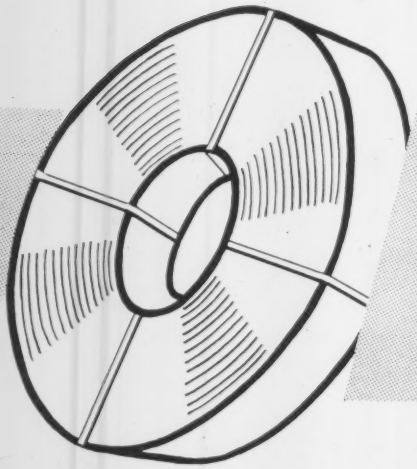
*Current prices were published in the Nov. 10 issue and will appear in subsequent issues.



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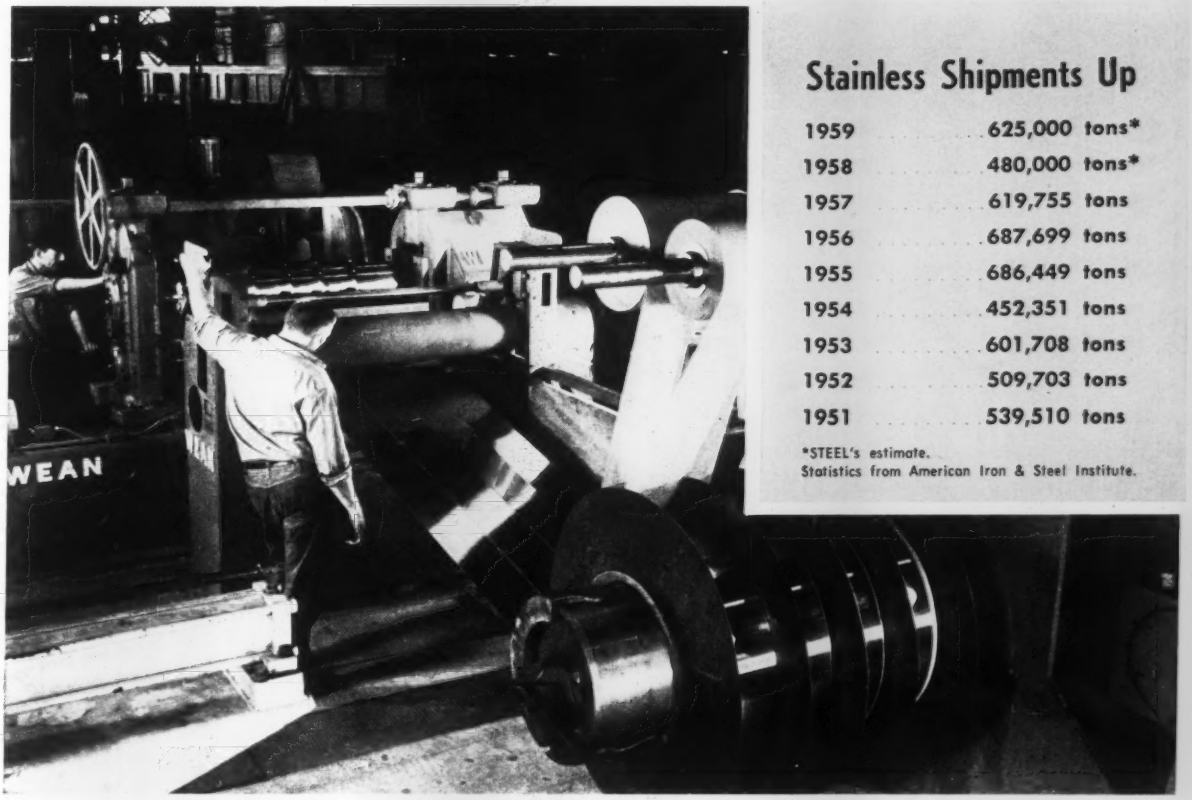


Stainless slitting line at new Jones & Laughlin Steel Corp. plant, Louisville, Ohio

Stainless Shipments Up

1959	625,000 tons*
1958	480,000 tons*
1957	619,755 tons
1956	687,699 tons
1955	686,449 tons
1954	452,351 tons
1953	601,708 tons
1952	509,703 tons
1951	539,510 tons

*STEEL's estimate.
Statistics from American Iron & Steel Institute.

Stainless Prospects Brighten 30%

Shipments are picking up speed and will accelerate more when auto production hits high gear. Appliance and other industries are increasing orders, steelmakers report

STAINLESS STEELMAKERS say they'll snap out of their sales slowdown in 1959. They look for a 30 per cent gain.

Shipments are already on the upgrade (September was the best month since October, 1957), but substantial improvement in '59 will depend on a good automotive year and successful selling against competing metals.

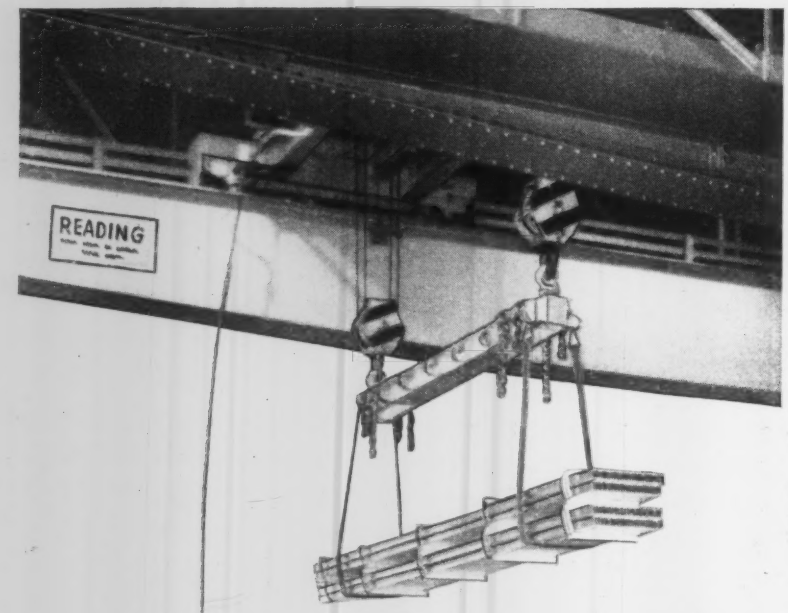
• **This Year: 480,000 Tons**—The American Iron & Steel Institute says shipment of stainless and heat resisting steels in the first three quarters came to 347,067 tons, vs. 490,195 tons in the same period of 1957. Stainless suppliers think shipments will average 45,000 tons per month during the balance of this year, resulting in a 1958 total of about 480,000 tons.

A Pittsburgh supplier notes: "October's shipments were about equal to September's. We're well booked for November and early December, although automakers' orders haven't matched expectations. Strip orders fell because of auto production slowdowns. Some orders have been set back. We will start 1959 with a rush as automotive demand builds up."

• **In 1959: 625,000 Tons**—"We think stainless shipments in 1959 will equal those of 1956," reports an optimistic eastern supplier. Shipments in that year totaled 687,699 tons. Most makers anticipate a 625,000-ton year.

Sales managers tie their outlook to auto sales and how well they think they can compete with aluminum. "If autos sell, stainless will sell," summarizes a midwestern producer. Automakers predict a sharp uptrend in 1959 sales, and their stainless purchases should be up in direct proportion.

Stainless suppliers also look for gains in usage per car. In 1958 models, the average Ford, Plymouth,



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Two 10-ton Cranes by Reading are now in operation at ALCOA's Lafayette, Indiana plant. One is used for heavy handling in the area around the 14,000-ton extrusion press, while the other has made an important contribution to easier, more economical warehousing.

The warehouse area crane, pictured above, operates from the floor by a pendant push-button station. Both crane slings and steel-handling racks are used. It's a spread bridge model and runs on a 220′ track.

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READING CRANE & HOIST CORPORATION, 2102 Adams St., Reading, Pa.

READING CRANES

CHAIN HOISTS · OVERHEAD TRAVELING CRANES · ELECTRIC HOISTS

and Chevrolet used 24 lb of stainless steel, reports the AISI Committee of Stainless Steel Producers. A 1958 Plymouth (Belvedere, two door hard top) used 23 lb. The 1959 model uses 27 lb. Ford, Dodge, and Chrysler reportedly are using more stainless this year, but Chevrolet dropped stainless decorative body molding in favor of aluminum on one model. The Chrysler Imperial has the "first" stainless steel roof.

"The average '59 has up to 15 per cent more stainless than the average '58," says one producer.

• **Potentials**—Sellers of the metal see growing applications in large bright areas such as roofs and moldings around windshields. They doubt that competing metals can challenge its dominance in wheel cover applications.

Aluminum suppliers also have their sights set on automotive applications—some are held by stainless. They say aluminum bumpers are a possibility (buses and some 1959 Cadillacs use them now). Extruded aluminum could also win some molding applications from stainless.

• **More Growing Markets**—While auto demand stalled last month, other markets perked up. "We're optimistic about future of stainless as a continuing growth product. There are definite signs of a business pickup. Industries returning to the market for the metal include guided missiles, aircraft, instruments, electronic, and food processing," reports Omar V. Greene, general sales manager, Carpenter Steel Co., Reading, Pa.

Appliance demand is edging upward. A Pittsburgh manufacturer says appliance producers have little stainless in stock and could need much more, quickly. "There's a definite increase in use of the metal in sinks," add sales officials at Republic Steel Corp., Cleveland.

"We see a marked improvement in our shipments to manufacturers of food processing equipment. Shipments to transportation equipment producers are on the upgrade," say officials of Washington Steel Corp., Washington, Pa.

Export demand is firm, continues an eastern producer. Stainless is in strong demand for railroad cars in Europe.

Applications in missiles and super-

sonic aircraft are far from reaching their potential. Uses give manufacturers prestige but little tonnage—although they expect gains. "The industry is willing to experiment with 'jet age' uses, even at a loss, because we're confident of the metal's value," one manufacturer concludes. "The planes and missiles that will require big tonnages are still on the drawing boards."

Stainless Steel . . .

Stainless Steel Prices, Page 169

Production of stainless and heat-resisting steel ingots in the third quarter totaled 213,283 net tons, reports the American Iron & Steel Institute. Output in the second quarter was 200,048 tons; in the third quarter last year, it was 221,-260.

Third quarter production brought the total for the first nine months to 592,462 net tons, or 201,271 tons below the 793,733 produced in the first three quarters of 1957.

Stainless sheetmakers are booked into late December, with orders extending into January. Stainless wire and bar demand also has shown improvement over the last couple of weeks, but deliveries are still easy in both products.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 164 & 165

Sheet orders are increasing. December shipments will run heavier than those this month despite the yearend holiday and inventory season.

Automakers, now getting plants into production following settlement of local strikes, are seeking additional tonnages for delivery this month and next. There isn't much that can be done for them this month, but they can be accommodated in December. The larger auto companies have taken all the steel the mills allotted them on the basis of earlier estimates of their requirements.

Hot-rolled sheets are available for delivery in three to five weeks, cold rolled within four to six weeks. Producers are sold out for virtually the remainder of the year on coated sheets and specialties; bookings in some instances extend into January. Enameling stock is sold into that month, reflecting

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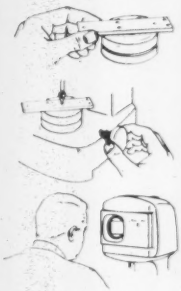

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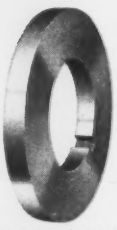
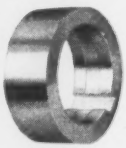
ROTARY KNIVES

SLITTING KNIFE



TRIMMING KNIFE

CARBIDE KNIFE



SPACER

Specify Cowles—world's largest manufacturer of rotary knives—to get more tonnage per grind, and cut production costs. Our exceedingly high standards of precision manufacture and exacting heat treatment assure utmost accuracy, efficiency and long life. Complete line including slitting, trimming and specially engineered knives, in our **Max-cut; Specialloy; Superalloy; Circle C** and **Super C** grades—also carbide knives — for any requirement. Prompt delivery. Engineering help on any job. **Let Cowles quote on your requirements.**

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COWLES TOOL COMPANY
2050 WEST 110th STREET, CLEVELAND 2, OHIO
REPRESENTATIVES IN ALL PRINCIPAL CITIES

good demand from makers of household appliances and sanitaryware.

Sellers of silicon sheets can work a little tonnage into rolling schedules before the end of the year, but, in general, they hold good-sized orders for January shipment. Stainless sheetmakers are booked into late December, with some orders extending into January.

Deliveries are likely to become more extended in the various sheet classifications next year, but no one anticipates a shortage.

The tight delivery situation in galvanized sheets is surprising. Normally, demand for this item would be declining now for seasonal reasons. Some producers are booked heavily through January, but eastern mills, for example, are reported offering galvanized sheets for December shipment.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 163

Contractors are driving hard to beat the onset of bad weather. Their activity is reflected in continued excellent demand for reinforcing bars. Demand for re-bars will probably drop noticeably with the first severe dip of the thermometer.

Orders extend into next year on a project basis. Such future ordering is about on a par with that of last year. Business in wire mesh is running the same as in re-bars.

Steel Bars . . .

Bar Prices, Page 163

Deliveries have staved in the two to four week range the last month or so, but shipments of hot-rolled carbon bars are tightening, reflecting a steady improvement in demand over recent weeks.

Warehouse operators are specifying a little more freely, and inquiry from the cold drawers is holding up well. In general, orders are coming out from a broader area of manufacturing, with medium and heavy rounds, squares, and flats moving particularly well.

Buyers are not committing themselves far ahead. In fact, barmakers say some consumers are purchasing almost hand-to-mouth. But good volume is expected the rest of this year with automotive schedules rising.

Fair improvement in demand for

cold-finished bars is noted. It is essentially of automotive origin. Slightly more activity in alloy bars is also attributable to rising automotive requirements.

Tin Plate . . .

Tin Plate Prices, Page 165

Tin mills have been running pretty close to 90 per cent of capacity in recent weeks, but production is expected to drop to the sixties in the next several weeks. The heavy fall shipments to the canmakers and other consumers anxious to beat the Nov. 1 price increase account for the good October showing.

Wire . . .

Wire Prices, Pages 165 & 166

Manufacturers' wire is moving in better volume with delayed automotive specifications coming through to the mills. New life is also being put into this market by fastener makers and miscellaneous manufacturers of products such as coat hangers, welded forms for racks, and fan guards.

Indications are December orders will be less pressing, compared with those in October and November. One reason: A desire to keep down inventory at yearend because of taxes. Some users have placed orders for January shipment.

An influx of foreign wire continues to be a disturbing influence in the domestic market.

The General Stores Supply Office, Navy, Philadelphia, has placed contracts for welding electrodes: 342 tons, Reid Avery Co., Baltimore; 122 tons, Air Reduction Co. Inc., New York; 200 tons of steel wire nails and 702,000 ft of steel wire rope, $106,362, to the Metimpex Corp., New York.

Plates . . .

Plate Prices, Page 163

Were it not for shipwork, platemakers would be hard pressed to keep their facilities engaged. Demand from tank fabricators and for weldments continues to lag. While railroad requirements are a shade better, volume moving to the carriers is limited.

Indicative of the general dullness: Deliveries can be had within two to three weeks without difficulty—

The new Townsend Versa-Lockbolt* is an improved, yet more economical type. Design changes have increased the grip range of the fasteners and made it feasible to use them in relatively oversized holes. They are more economical to manufacture and the savings are passed on to you.

The high tensile pre-load values and positive locking action which have made lockbolted joints absolutely vibration-proof in the past are also provided by the Versa-Lockbolts. The new flanged integral washer-collars make Versa-Lockbolts especially suitable for fastening even light gage materials.

The wider grip ranges provided by additional locking grooves in the Versa-Lockbolt permit a reduction in the sizes stocked, reducing inventory costs and increasing production line flexibility. Installation inspection is reduced, since hole sizes are less critical. These savings, plus the lower cost of the fasteners made Versa-Lockbolts a truly economical method of vibration-proof fastening.

For full information, write Townsend Company, P. O. Box 237-C, New Brighton, Pa.

*Licensed under Huck patents RE 22,792; 2,114,493; 2,527,307; 2,531,048; 2,531,049 and 2,754,703

The Fastening Authority

Townsend

COMPANY • ESTABLISHED 1816

NEW BRIGHTON, PENNSYLVANIA

Sales Offices in Principal Cities

Cherry Rivet Division • Santa Ana, California

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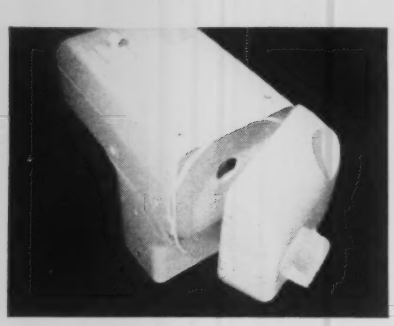
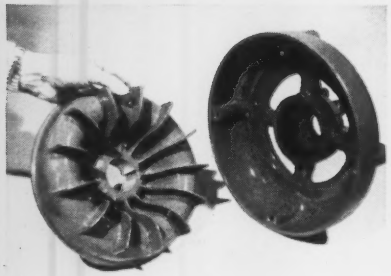
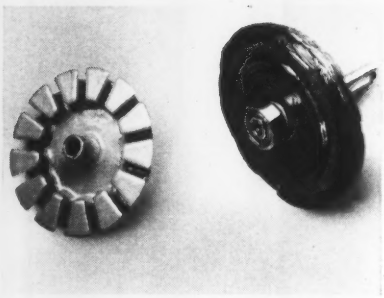


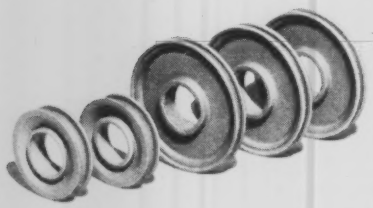
CORVEL Cellulosic Finishes—wide variety of colors with high surface gloss; excellent retention of both color and gloss in water, salt spray, sunlight.



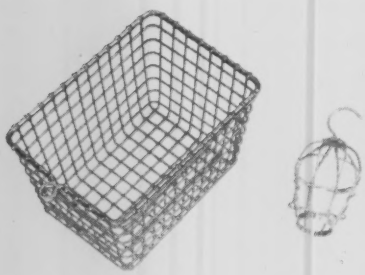
CORVEL Vinyl Finishes—durable with extreme toughness; resistant to corrosion and most chemicals. Available in a range of colors.



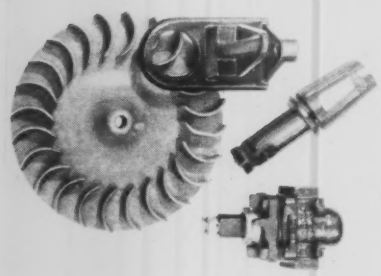
CORVEL Epoxy Finishes—excellent insulation at elevated temperatures; moisture, chemical and impact resistant. Provide a hard, smooth surface.



CORVEL Nylon Finishes—to impart the outstanding wear and low frictional qualities of nylon in coating metals and other base materials.



CORVEL Polyethylene Finishes—provide zero water absorption, excellent chemical resistance and electrical insulation.



CORVEL K-51 Penton Finishes—exceptional chemical and wear resistance. K-51 Penton finishes can withstand temperatures from −40° F. to 250° F.*

*Trademark of Hercules Powder Co.

CORVEL† Fusion Bond Finishes— Six new engineered resins for product finishing

CORVEL finishes are specially processed dry powders, formulated for use in the patented** fluidized bed coating process. These finishes give you the following outstanding advantages:

- Comparatively heavy finishes (from approximately 0.005″ to 0.062″) obtained by a single dipping treatment—*without* the use of solvents.
- Finishes unmarred by sags, drips or bridging.
- Uniformity in thickness, with excellent coverage of sharp edges, corners and projections.

Thus, CORVEL finishes can give your products improved durability and appearance at minimum cost, and provide new design possibilities.

Process licensing is now readily available. A process license is automatically extended to the purchaser of CORVEL powders from National Polymer Products, Inc. upon payment of a small royalty added to each sales invoice. General licenses to use the patented process are available from Polymer Processes, Inc., an affiliate company.

Information relating the advantages of CORVEL Fusion Bond Finishes, to your particular products and details on the fluidized bed process and equipment are available from National Polymer Products, Inc. Write today for a copy of the new CORVEL Bulletin.

NATIONAL POLYMER PRODUCTS, INC.

A subsidiary of The Polymer Corporation

Reading, Pennsylvania

POLYPENCO®

†*Polymer Corporation trademark for finishing materials*

**U. S. Patent 2,844,489 and over 30 patents pending

Steel Product Shipments—September, 1958

(All grades; net tons)

Products	September, 1958 Carbon	Alloy	Stainless	First Nine Months 1958	1957
Ingots	11,955	7,972	1,247	195,405	374,766
Blooms, etc.	70,526	27,275	1,404	791,324	1,939,791
Tube rounds	973	150	.....	7,125	52,930
Skelp	13,392	.....	.....	77,240	121,407
Wire rods	82,469	1,740	522	616,288	740,805
Structurals	312,225	2,539	6	2,934,434	5,166,376
Steel piling	36,858	.....	.....	335,559	443,211
Plates	362,288	28,878	2,467	3,853,825	7,386,348
Rails—standard	25,342	.....	.....	432,988	1,015,576
Rails—other	2,026	.....	.....	30,195	70,497
Joint bars	2,667	.....	.....	28,727	71,238
Tie plates	6,623	.....	.....	92,512	216,460
Track spikes	2,411	.....	.....	32,455	64,244
Wheels	10,659	59	.....	118,046	289,657
Axles	4,036	7	.....	58,807	161,610
Bars—HR	408,469	106,458	2,624	3,914,302	5,956,626
Bars—reinforcing	192,626	.....	.....	1,555,495	1,882,195
Bars—CF	75,330	14,290	4,037	708,461	1,030,314
Tool steel	639	5,351	.....	49,617	77,511
Standard pipe	187,383	61	.....	1,621,930	2,126,811
Oil country	69,423	14,977	.....	801,218	2,268,209
Line pipe	214,819	24	.....	2,074,745	3,262,249
Mechanical tubing	37,911	14,762	282	388,856	616,727
Pressure tubing	16,646	3,415	887	182,408	327,101
Drawn wire	205,981	3,422	2,093	1,715,325	2,026,912
Nails, staples	36,116	.....	.....	328,771	364,147
Barbed wire	3,517	.....	.....	48,178	51,896
Woven fence	9,302	.....	.....	135,340	175,253
Bale ties, etc.	2,097	.....	.....	52,767	44,263
Black plate	63,961	.....	.....	464,714	483,196
Tin plate & terne plate—HD	43,217	.....	.....	356,698	578,779
Tin plate—electrolytic	525,739	.....	.....	4,012,753	3,911,688
Sheets—HR	595,113	20,062	2,120	4,272,234	6,042,697
Sheets—CR	950,189	3,739	10,923	6,867,738	8,797,576
Sheets—galvanized	258,723	.....	.....	2,018,310	1,830,016
Sheets—other	17,058	.....	.....	121,466	150,235
Electrical sheets & strip	3,243	35,001	.....	315,418	491,258
Strip—HR	102,306	2,118	735	701,186	1,072,636
Strip—CR	80,974	2,193	17,220	689,621	906,117
Total 1958	5,045,232	294,493	46,567	43,002,481	.....
Total 1957	5,764,811	363,136	43,727	.....	62,589,328

Data from American Iron & Steel Institute.

Steel Shipments by Markets—September, 1958

(All grades; net tons)

Markets	September Shipments 1958	1957	First Nine Months 1958	1957
Converting, processing	250,921	298,329	2,067,592	2,802,466
Forging (except auto)	63,828	66,277	523,536	848,455
Fasteners	85,950	97,791	563,953	864,883
Warehouses:				
Oil & gas	75,715	168,265	690,575	1,905,028
All other	861,999	930,184	7,084,974	9,803,194
Total warehouse	937,714	1,098,449	7,775,549	11,708,222
Construction:				
Rail transportation	4,887	6,142	35,044	52,577
Oil & gas	179,866	296,821	1,665,122	2,692,666
All other	541,182	706,028	4,896,987	6,892,283
Total construction	725,935	1,008,991	6,597,153	9,637,526
Contractors' Products	295,632	262,341	2,522,174	2,687,941
Automotive:				
Cars, trucks, etc.	1,030,609	1,134,864	6,388,671	10,141,366
Forgings	25,150	27,266	179,508	251,630
Total automotive	1,055,759	1,162,130	6,568,179	10,392,996
Rail Transportation:				
Rails, track, equip.	35,095	67,092	464,529	1,242,701
Cars, locomotives	66,384	216,246	613,878	2,155,420
Rapid Transit, etc.	794	3,965	15,410	29,924
Total transportation	102,273	287,303	1,093,817	3,428,045
Shipbuilding	53,531	124,406	613,326	931,668
Aircraft	5,361	5,657	43,956	85,234
Oil & gas drilling	28,833	53,048	220,892	581,267
Mining, quarrying, etc.	14,373	28,822	134,560	265,863
Agricultural:				
Machinery	73,427	67,165	649,816	661,963
All other	30,288	15,009	223,564	147,403
Total agricultural	103,715	82,174	873,380	809,366
Machinery, tools, etc.	274,891	314,413	2,223,734	3,603,619
Electrical Machinery, etc.	150,274	155,262	1,260,433	1,627,072
Appliances, utensils, etc.	145,720	123,214	1,060,398	1,146,245
Other equipment	150,371	142,543	1,226,418	1,424,415
Containers:				
Cans & closures	553,950	342,083	4,226,420	4,048,902
Barrels, drums, etc.	72,897	59,812	576,415	660,383
All other	52,004	44,223	363,368	473,847
Total containers	678,851	446,118	5,166,203	5,183,132
Ordnance, military	18,423	21,415	186,561	300,202
Nonreported shipments	65,638	64,348	500,042	652,690
Exports	178,299	328,643	1,780,625	3,608,021
Total shipments	5,386,292	6,171,674	43,002,481	62,589,328

Data from American Iron & Steel Institute.

even sooner in a few instances. The range applies to sheared plates and universal and strip-plates.

Plate fabricators are holding off placing orders for steel until fabrication orders are confirmed. Then they place their plate needs on the basis of two to three week shipments. Clad plate orders are off.

Sees Far West Steel Gain

Consumers' steel receipts in the Far West during 1959 will be 10 per cent above those in 1958, but will probably not reach the 1957 record total.

That's the prediction of Kaiser Steel Corp., Oakland, Calif., in a "Report to Far Western Steel Purchasers."

The 1959 increase is expected from: 1. A pickup in consumption. 2. A shift from inventory reduction to a moderate inventory buildup.

Receipts in the area (California, Oregon, Washington, Arizona, Utah, Nevada, and Idaho) during 1958 will show a decline of nearly 1 million tons—winding up between 5 million and 6 million, compared with the 1957 total of 6,797,000 tons. The 1958 total, though, will top receipts in recession 1954 by about 10 per cent.

Major reasons for the 1958 decline: 1. Reduced activity in steel consuming industries. 2. Increased dependence on inventories to support manufacturing operations.

The record of the 1957 steel market in the area is highlighted:

- Steel receipts reached a new high while national domestic shipments declined.
- Plate and structural receipts were up 28 per cent from 1956 due to simultaneous peaking of many types of construction.
- Direct mill shipments of fabricators increased 300,000 tons.
- Receipts of western steel service centers amounted to 23 per cent of the total western market, off 1 per cent from 1956—nationally, steel service centers received 19 per cent of domestic shipments.
- Southern California received 41 per cent of the total receipts in the Far West, down 2 per cent from 1956, reflecting smaller intake of hot and cold rolled sheets, and tin mill products.
- Arizona, Nevada, Utah, and

Idaho increased their share of the market—to 12 per cent from 10 per cent, due to heavier demands for structurals, sheared plate and pipe. • Northern California represented 31 per cent of the western market, and Oregon and Washington, 16 per cent, unchanged from 1956.

Semifinished Steel . . .

Semifinished Prices, Page 163

Steelmaking operations went up one point last week to 75.5 per cent of capacity, the highest rate since last fall. Tonnage output for the week, estimated at about 2,035,000 net tons, was the largest since the week ended Nov. 3, 1957.

Bethlehem Pacific Coast Steel Corp. recently placed two electric furnaces in operation at its rebuilt Seattle plant. Capacity is estimated at 35,000 tons of ingots monthly. A new blooming mill was activated last month.

Structural Shapes . . .

Structural Shape Prices, Page 163

Structural steel business is bolstered by a fair number of small and medium sized construction jobs, including a substantial volume of public work. But the general trend is downward; fabricators are shipping more tonnage than they are booking.

Most shops can work in tonnage for delivery within two to three months, although most shops' backlogs extend a little longer than that. Seasonal slackening in construction activity will cut backlogs over the next couple of months, and fabricators are not adding to plain material inventories; they are ordering tonnage as new contracts are booked. Structural shape deliveries range two to four weeks.

Outstanding current contracts include 29,000 tons for an office building in Boston, 1000 tons for the Peace River Bridge on the Alaska highway, and 2100 tons for a vehicular bridge and approaches between the mainland and Goat Island, Niagara Falls, N. Y.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1000 tons, reconstruction of 2300-ft Peace River Bridge, Alaska Highway, to Dominion Bridge Co. Ltd., Burnaby, B. C., by Defense Construction, Ottawa, Ont., bids Oct. 9; award at $2,965,000.

400 tons, miscellaneous items, Ice Harbor power project, to Pacific Car & Foundry Co., Seattle; Guy F. Atkinson Co., South San Francisco, general contractor.

164 tons, state bridge, New Castle County, Delaware, through James Gulian Inc., general contractor, to Budd Metal Products Co., Wilmington, Del.

150 tons, taintor gates, etc., Oxbow power project, Snake River, to Pacific Car & Foundry Co., Seattle, by Idaho Power Co.

125 tons, additional award for Rocky Reach Dam, to Pacific Car & Foundry Co., Seattle.

STRUCTURAL STEEL PENDING

1062 tons, state bridgework, Monroe County, New York; bids Nov. 20.

690 tons, Montana state, Thompson Falls Bridge; Peter Kiewit Sons Co., Seattle, reported low bidder.

500 tons, approachwork, section No. 7, lower level expansion of the George Washington Bridge, over the Hudson River; bids to be received by the Port of New York Authority, 111 Eighth Ave., New York, N. Y., Dec. 2.

470 tons, state bridge, Nassau County, New York; bids Nov. 20.

352 tons, state bridgework, Farnhurst Interchange, New Castle County, Delaware, Burger Construction Co., Dover, Del., low on general contract.

222 tons, state bridgework, Erie County, New York; bids Nov. 20.

128 tons, state bridgework, Route 18 (1953), section 4, Middlesex County, New Jersey; bids Nov. 25.

165 tons, state bridgework, Greene County, New York; bids Nov. 20.

80 tons, also 25 tons of reinforcing bars, addition to Dawson County substation, Glendive, Mont.; bids to the Bureau of Reclamation, Dec. 4.

REINFORCING BARS . . .

REINFORCING BARS PLACED

250 tons, nurses' residence, University of Pennsylvania, Philadelphia, through Wark Co., general contractor, to American Steel Engineering Co., Philadelphia.

145 tons, Washington State, Cloverdale underpass, Seattle, to Soule Steel Co., Seattle; Quigg Bros.-McDonald Inc., Aberdeen, Wash., general award at $431,288.

125 tons, 410-ft Montana state, Sanders County bridge, to unstated interest; W. P. Roscoe, Billings, Mont., general contractor.

STRUCTURAL STEEL PENDING

800 tons, Overlake Catholic School, Seattle; bids Nov. 13.

110 tons, 108-ft dual and 218-ft single spans, Montana highway projects, Cascade County; also shapes, lump sum bid asked; bids to Helena, Mont., Nov. 19.

100 tons, also 2880 ft of steel casing, two projects, Skamania County, Wash., and Skagit County, Wash.; bids to Bureau of Public Roads, Portland, Oreg., Nov. 20 and Nov. 24.

40 tons, also unstated tonnage of structurals, lump sum bid, Montana overpass, Hill County; bids to Helena, Mont., Nov. 19.

PLATES . . .

PLATES PLACED

560 tons, carbon hull plates, General Stores Supply Office, Navy, Philadelphia, to Phoenix Iron & Steel Co., Harrisburg, Pa.

217 tons, structural plate, Corps of Engineers, San Francisco, to Carbon Steel Products Corp., New York.

170 tons, floor plates, General Stores Supply Office, Navy, Philadelphia, to Alan Wood Steel Co., Conshohocken, Pa.

168 tons, carbon hull plates, General Stores Supply Office, Navy, Philadelphia, to Hunterspoint Steel Co., Long Island City, New York.

PIPE . . .

CAST IRON PIPE PLACED

160 tons, 16 in., for District No. 68, Bellevue, Wash., to Pacific States Cast Iron Pipe Co., Seattle.

85 tons, 6-in. pipe for Auburn, Wash., and 14-in. for Portland, Oreg., to Pacific States Cast Iron Pipe Co., Seattle.

RAILS, CARS . . .

RAILROAD CARS PLACED

Baltimore & Ohio, conversion of ten flatcars for piggybacking, to its own shops.

DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

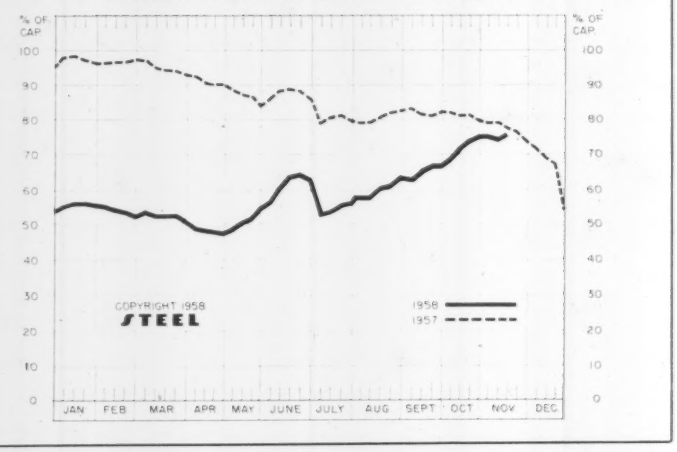
	Week Ended Nov. 16	Change	Same Week 1957	Same Week 1956
Pittsburgh	69.5	0*	79	97
Chicago	88	+ 5	80	100
Eastern	72	0	83	102
Youngstown	62	— 2	66	104
Wheeling	84.5	0	69	101.5
Cleveland	69	—10*	81	102.5
Buffalo	78	+ 2.5	85.5	107.5
Birmingham	56.5	— 3.5	60.5	95.5
Cincinnati	86	— 0.5*	81.5	96.5
St. Louis	99	+ 3	89.5	106
Detroit	96	+10.5*	95.5	100
Western	78	0	86	109
National Rate	75.5	+ 1	77.5	100.5

INGOT PRODUCTION‡

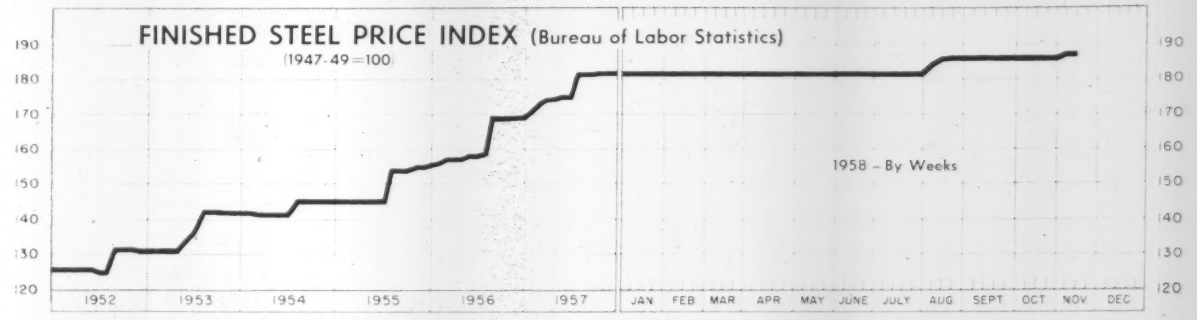
	Week Ended Nov. 16	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	126.3†	125.2	124.7	123.9
NET TONS (In thousands)	2,029†	2,011	2,003	1,990

*Change from preceding week's revised rate. †Estimated. ‡American Iron & Steel Institute. Weekly capacity (net tons): 2,699,173 in 1958; 2,559,490 in 1957; 2,461,893 in 1956.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



Nov. 11, 1958	Week Ago	Month Ago	Oct. Avg	Year Ago
187.4	187.3	186.7	186.7	181.7

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Nov. 11

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.825	Bars, Reinforcing	6.385
Rails, Light, 40 lb	7.292	Bars, C.F., Carbon	10.710
Tie Plates	6.875	Bars, C.F., Alloy	14.125
Axles, Railway	10.175	Bars, C.F., Stainless, 302 (lb)	0.553
Wheels, Freight Car, 33 in. (per wheel)	62.000	Sheets, H.R., Carbon	6.350
Plates, Carbon	6.350	Sheets, C.R., Carbon	7.300
Structural Shapes	6.167	Sheets, Galvanized	8.689
Bars, Tool Steel, Carbon (lb)	0.560	Sheets, C.R., Stainless, 302 (lb)	0.688
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.680	Sheets, Electrical	12.625
Bars, Tool Steel, H.R., Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.400	Strip, C.R., Carbon	9.489
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.895	Strip, C.R., Stainless, 430 (lb)	0.493
Bars, H.R., Alloy	10.775	Strip, H.R., Carbon	6.250
Bars, H.R., Stainless, 303 (lb)	0.525	Pipe, Black, Buttweld (100 ft)	20.525
Bars, H.R., Carbon	6.675	Pipe, Galv., Buttweld (100 ft)	24.315
		Pipe, Line (100 ft)	205.710
		Casing, Oil Well, Carbon (100 ft)	201.080
		Casing, Oil Well, Alloy (100 ft)	315.213
Tubes, Boiler (100 ft)	51.200	Black Plate, Canmaking Quality (95 lb base box)	7.900
Tubing, Mechanical, Carbon (100 ft)	26.157	Wire, Drawn, Carbon	10.575
Tubing, Mechanical, Stainless, 304 (100 ft)	205.608	Wire, Drawn, Stainless, 430 (lb)	0.653
Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	10.100	Bale Ties (bundles)	7.967
Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.800	Nails, Wire, 8d Common	9.828
		Wire, Barbed (80-rod spool)	8.719
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	Nov. 12 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	247.82	247.82	246.65	239.15	189.38
Index in cents per lb	6.713	6.713	6.682	6.479	5.130

STEEL's ARITHMETICAL PRICE COMPOSITES*

Finished Steel, NT	$149.96	$149.96	$149.28	$146.03	$115.18
No. 2 Fdry Pig Iron, GT	66.49	66.49	66.49	66.49	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	56.04
Malleable Pig Iron, GT	67.27	67.27	67.27	67.27	57.27
Steelmaking Scrap, GT	42.33	42.33	42.33	33.17	35.33

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Nov. 12 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.675	5.675	5.675	5.425	4.15
Bars, H.R., Chicago	5.675	5.675	5.675	5.425	4.15
Bars, H.R., deld. Philadelphia	5.975	5.975	5.975	5.725	5.302
Bars, C.F., Pittsburgh	7.65*	7.65*	7.65*	7.30*	5.20
Shapes, Std., Pittsburgh	5.50	5.50	5.50	5.275	4.10
Shapes, Std., Chicago	5.50	5.50	5.50	5.275	4.10
Shapes, deld., Philadelphia	5.77	5.77	5.77	5.545	4.38
Plates, Pittsburgh	5.30	5.30	5.30	5.10	4.10
Plates, Chicago	5.30	5.30	5.30	5.10	4.10
Plates, Coatesville, Pa.	5.30	5.30	5.30	5.10	4.35
Plates, Sparrows Point, Md.	5.30	5.30	5.30	5.10	4.10
Plates, Claymont, Del.	5.30	5.30	5.30	5.70	4.55
Sheets, H.R., Pittsburgh	5.10	5.10	5.10	4.925	3.925
Sheets, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Sheets, C.R., Pittsburgh	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Chicago	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Detroit	6.275	6.275	6.275	6.05-6.15	4.975
Sheets, Galv., Pittsburgh	6.875	6.875	6.875	6.60	5.275
Strip, H.R., Pittsburgh	5.10	5.10	5.10	4.925	3.975-4.425
Strip, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Strip, C.R., Pittsburgh	7.425	7.425	7.425	7.15	5.45-5.95
Strip, C.R., Chicago	7.425	7.425	7.425	7.15	5.70
Strip, C.R., Detroit	7.425	7.425	7.425	7.25	5.45-6.05
Wire, Basic, Pittsburgh	8.00	8.00	8.00	7.65	5.475-5.525
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.95	6.35-6.55
Tin plate (1.50 lb)box, Pitts.	$10.65	$10.65	$10.30	$10.30	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$99.50	$99.50	$99.50	$96.00	$75.50
Wire rods $\frac{7}{32}$-$\frac{5}{8}$" Pitts.	6.40	6.40	6.40	6.15	4.525

PIG IRON, Gross Ton	Nov. 12 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$67.00	$67.00	$67.00	$67.00	$57.00
Basic, Valley	66.00	66.00	66.00	66.00	56.00
Basic, deld., Phila.	70.41	70.41	70.41	70.01	60.75
No. 2 Fdry, Neville Island, Pa.	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	70.51	61.25
No. 2 Fdry, Birm.	62.50	62.50	62.50	62.50	52.88
No. 2 Fdry (Birm.) deld. Cin.	70.20	70.20	70.20	70.20	60.43
Malleable, Valley	66.50	66.50	66.50	66.50	56.50
Malleable, Chicago	66.50	66.50	66.50	66.50	56.50
Ferromanganese, net ton†	245.00	245.00	245.00	245.00	200.00

†74-76% Mn, Duquesne, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$44.50	$44.50	$43.50	$32.50	$37.50
No. 1 Heavy Melt, E. Pa.	40.00	40.00	41.00	34.50	35.00
No. 1 Heavy Melt, Chicago	42.50	42.50	42.50	32.50	33.50
No. 1 Heavy Melt, Valley	43.50	43.50	43.50	31.50	35.50
No. 1 Heavy Melt, Cleve.	40.00	40.00	40.00	28.50	33.50
No. 1 Heavy Melt, Buffalo	35.50	35.50	35.50	32.50	34.50
Rails, Rerolling, Chicago	62.00	62.00	62.50	46.50	45.00
No. 1 Cast, Chicago	45.50	45.50	45.50	35.50	33.50

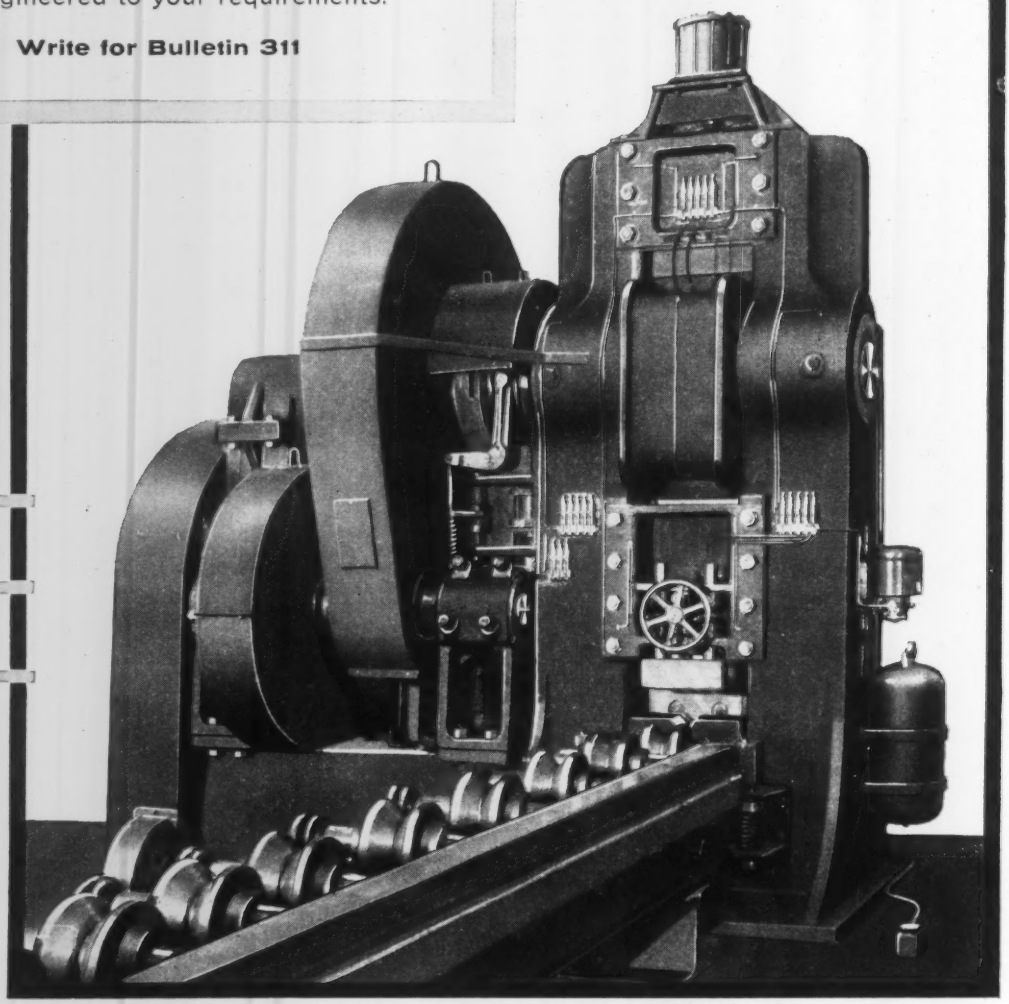
COKE, Net Ton					
Beehive, Furn., Connlsvl.	$15.25	$15.25	$15.25	$15.25	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.25	16.75
Oven, Fdry., Milwaukee	30.50	30.50	30.50	30.50	25.25

THE TREND IS TO THOMAS *FOR* BILLET SHEARS

Here illustrated is a Thomas Billet Shear . . . sturdily built, of all-steel construction . . . with "beef" where "beef" should be . . . a machine you don't need to pamper! It'll insure more dependable production day in and day out . . . with more strokes per minute. It's rigid, accurate, rugged, faster!

The Thomas line includes capacities from 500 to 2500 tons. Higher tonnage may be engineered to your requirements.

Write for Bulletin 311



THOMAS also builds

PUNCHES

PRESSES

BENDERS

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73

THOMAS MACHINE MANUFACTURING CO. / PITTSBURGH 23, PA.

Steel Prices

Mill prices as reported to STEEL, Nov. 12, cents per pound except as otherwise noted. Changes shown in italics. Code number following mill points indicates producing company. Key to producers, page 164; footnotes, page 166.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 ..... $76.00

INGOTS, Alloy (NT)
Detroit S41 ..... $82.00
Economy,Pa. B14 ..... 82.00
Farrell,Pa. S3 ..... 82.00
Lowellville,O. S3 ..... 82.00
Midland,Pa. C18 ..... 82.00
Munhall,Pa. U5 ..... 82.00
Sharon,Pa. S3 ..... 82.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bartonville,Ill. K4 ..... $82.00
Bessemer,Pa. U5 ..... 80.00
Buffalo R2 ..... 80.00
Clairton,Pa. U5 ..... 80.00
Ensley,Ala. T2 ..... 80.00
Fairfield,Ala. T2 ..... 80.00
Fontana,Calif. K1 ..... 90.50
Gary,Ind. U5 ..... 80.00
Johnstown,Pa. B3 ..... 80.00
Lackawanna,N.Y. B2 ..... 80.00
Munhall,Pa. U5 ..... 80.00
Owensboro,Ky. G8 ..... 80.00
S.Chicago,Ill. R2, U5 ..... 80.00
S.Duquesne,Pa. U5 ..... 80.00
Sterling,Ill. N15 ..... 80.00
Youngstown R2 ..... 80.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ..... $99.50
Buffalo R2 ..... 99.50
Canton, O. R2 ..... 102.00
Clairton,Pa. U5 ..... 99.50
Conshohocken,Pa. A3 ..... 104.50
Ensley,Ala. T2 ..... 99.50
Fairfield,Ala. T2 ..... 99.50
Farrell,Pa. S3 ..... 99.50
Fontana,Calif. K1 ..... 109.00
Gary,Ind. U5 ..... 99.50
Geneva,Utah C11 ..... 99.50
Houston S5 ..... 104.50
Johnstown,Pa. B2 ..... 99.50
Lackawanna,N.Y. B2 ..... 99.50
LosAngeles B3 ..... 109.00
Midland,Pa. C18 ..... 99.50
Munhall,Pa. U5 ..... 99.50
Owensboro,Ky. C8 ..... 99.50
Seattle B3 ..... 113.00
Sharon,Pa. S3 ..... 99.50
S.Chicago R2, U5, W14 ..... 99.50
S.Duquesne,Pa. U5 ..... 99.50
S.SanFrancisco B3 ..... 109.00
Warren,O. C17 ..... 99.50

Alloy, Forging (NT)
Bethlehem,Pa. R2 ..... $119.00
Bridgeport,Conn. C32 ..... 119.00
Buffalo R2 ..... 119.00
Canton,O. R2, T7 ..... 119.00
Conshohocken,Pa. A3 ..... 126.00
Detroit S41 ..... 119.00
Economy,Pa. B14 ..... 119.00
Farrell,Pa. S3 ..... 119.00
Fontana,Calif. K1 ..... 140.00
Gary,Ind. U5 ..... 119.00
Houston S5 ..... 124.00
Ind.Harbor,Ind. Y1 ..... 119.00
Johnstown,Pa. B2 ..... 119.00
Lackawanna,N.Y. B2 ..... 119.00
LosAngeles B3 ..... 139.00
Lowellville,O. S3 ..... 119.00
Massillon,O. R2 ..... 119.00
Midland,Pa. C18 ..... 119.00
Munhall,Pa. U5 ..... 119.00
Owensboro,Ky. G8 ..... 119.00
Sharon,Pa. S3 ..... 119.00
S.Chicago R2,U5,W14 ..... 119.00
S.Duquesne,Pa. U5 ..... 119.00
Struthers,O. Y1 ..... 119.00
Warren,O. C17 ..... 119.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 ..... $122.50
Canton,O. R2 ..... 125.00
Cleveland R2 ..... 122.50
Gary,Ind. U5 ..... 122.50
S.Chicago,Ill. R2, W14 ..... 122.50
S.Duquesne,Pa. U5 ..... 122.50
Warren,O. C17 ..... 122.50

SKELP
Aliquippa,Pa. J5 ..... 5.05
Munhall,Pa. U5 ..... 5.05
Pittsburgh J5 ..... 5.05
Warren,O. R2 ..... 5.05
Youngstown R2, U5 ..... 5.05

WIRE RODS
AlabamaCity,Ala. R2 ..... 6.40
Aliquippa,Pa. J5 ..... 6.40
Alton,Ill. L1 ..... 6.60
Bartonville,Ill. K4 ..... 6.50
Buffalo W12 ..... 6.40
Cleveland A7 ..... 6.40
Donora,Pa. A7 ..... 6.40
Fairfield,Ala. T2 ..... 6.40
Houston S5 ..... 6.65
IndianaHarbor,Ind. Y1 ..... 6.40
Johnstown,Pa. B2 ..... 6.40
Joliet,Ill. A7 ..... 6.40
KansasCity,Mo. S5 ..... 6.65
Kokomo,Ind. C16 ..... 6.50
LosAngeles B3 ..... 7.20
Minnequa,Colo. C10 ..... 6.65
Monessen,Pa. P7 ..... 6.40
N.Tonawanda,N.Y. B11 ..... 6.40
Pittsburg,Calif. C11 ..... 7.20
Portsmouth,O. P12 ..... 6.40
Roebling,N.J. R5 ..... 6.50
S.Chicago,Ill. R2, W14 ..... 6.40
SparrowsPoint,Md. B2 ..... 6.50
Sterling,Ill.(1) N15 ..... 6.40
Sterling,Ill. N15 ..... 6.50
Struthers,O. Y1 ..... 6.40
Worcester,Mass. A7 ..... 6.70

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity,Ala. R2 ..... 5.50
Aliquippa,Pa. J5 ..... 5.50
Atlanta A11 ..... 5.70
Bessemer,Ala. T2 ..... 5.50
Bethlehem,Pa. B2 ..... 5.55
Birmingham C15 ..... 5.50
Clairton,Pa. U5 ..... 5.50
Fairfield,Ala. T2 ..... 5.50
Fontana,Calif. K1 ..... 6.30
Gary,Ind. U5 ..... 5.50
Geneva,Utah C11 ..... 5.50
Houston S5 ..... 5.60
Ind.Harbor,Ind. I-2, Y1 ..... 5.50
Johnstown,Pa. B2 ..... 5.55
Joliet,Ill. P22 ..... 5.50
KansasCity,Mo. S5 ..... 5.60
Lackawanna,N.Y. B2 ..... 5.55
LosAngeles B3 ..... 6.20
Minnequa,Colo. C10 ..... 5.80
Munhall,Pa. U5 ..... 5.50
Niles,Calif. P1 ..... 6.25
Phoenixville,Pa. P4 ..... 5.55
Portland,Oreg. O4 ..... 6.25
Seattle B3 ..... 6.25
S.Chicago,Ill. U5, W14 ..... 5.50
S.SanFrancisco B3 ..... 6.15
Sterling,Ill. N15 ..... 5.50
Torrance,Calif. C11 ..... 6.20
Weirton,W.Va. W6 ..... 5.50

Wide Flange
Bethlehem,Pa. B2 ..... 5.55
Clairton,Pa. U5 ..... 5.50
Fontana,Calif. K1 ..... 6.45
IndianaHarbor,Ind. I-2 ..... 5.50
Lackawanna,N.Y. B2 ..... 5.55
Munhall,Pa. U5 ..... 5.50
Phoenixville,Pa. P4 ..... 5.55
S.Chicago,Ill. U5 ..... 5.50
Weirton,W.Va. W6 ..... 5.50

Alloy Std. Shapes
Aliquippa,Pa. J5 ..... 6.80
Clairton,Pa. U5 ..... 6.80
Gary,Ind. U5 ..... 6.80
Houston S5 ..... 6.90
Munhall,Pa. U5 ..... 6.80
S.Chicago,Ill. U5, W14 ..... 6.80

H.S., L.A. Std. Shapes
Aliquippa,Pa. J5 ..... 8.05
Bessemer,Ala. T2 ..... 8.05
Bethlehem,Pa. B2 ..... 8.10
Clairton,Pa. U5 ..... 8.05
Fairfield,Ala. T2 ..... 8.05
Fontana,Calif. K1 ..... 8.85
Gary,Ind. U5 ..... 8.05
Geneva,Utah C11 ..... 8.05
Houston S5 ..... 8.15
Ind.Harbor,Ind. I-2, Y1 ..... 8.05
Johnstown,Pa. B2 ..... 8.10
KansasCity,Mo. S5 ..... 8.15
Lackawanna,N.Y. B2 ..... 8.10
LosAngeles B3 ..... 8.75
Munhall,Pa. U5 ..... 8.05
Seattle B3 ..... 8.80
S.Chicago,Ill. U5, W14 ..... 8.05
S.SanFrancisco B3 ..... 8.70
Struthers,O. Y1 ..... 8.05

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 ..... 8.10
Ind.Harbor,Ind. I-2 ..... 8.05
Lackawanna,N.Y. B2 ..... 8.10
Munhall,Pa. U5 ..... 8.05
S.Chicago,Ill. U5 ..... 8.05

PILING

REARING PILES
Bethlehem,Pa. B2 ..... 5.55
Ind.Harbor,Ind. I-2 ..... 5.50
Lackawanna,N.Y. B2 ..... 5.55
Munhall,Pa. U5 ..... 5.50
S.Chicago,Ill. I-2, U5 ..... 5.50

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ..... 6.50
Lackawanna,N.Y. B2 ..... 6.50
Munhall,Pa. U5 ..... 6.50
S.Chicago,Ill. I-2, U5 ..... 6.50
Weirton,W.Va. W6 ..... 6.50

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..... 5.30
Aliquippa,Pa. J5 ..... 5.30
Ashland,Ky.(15) A10 ..... 5.30
Atlanta A11 ..... 5.50
Bessemer,Ala. T2 ..... 5.30
Clairton,Pa. U5 ..... 5.30
Claymont,Del. C22 ..... 5.30
Cleveland J5, R2 ..... 5.30
Coatesville,Pa. L7 ..... 5.30
Conshohocken,Pa. A3 ..... 5.30
Ecorse,Mich. G5 ..... 5.30
Fairfield,Ala. T2 ..... 5.30
Farrell,Pa. S3 ..... 5.30
Fontana,Calif.(30) K1 ..... 6.10
Gary,Ind. U5 ..... 5.30
Geneva,Utah C11 ..... 5.30
GraniteCity,Ill. G4 ..... 5.40
Harrisburg,Pa. P4 ..... 5.30
Houston S5 ..... 5.40
Ind.Harbor,Ind. I-2, Y1 ..... 5.30
Johnstown,Pa. B2 ..... 5.30
Lackawanna,N.Y. B2 ..... 5.30
Mansfield,O. E6 ..... 5.30
Minnequa,Colo. C10 ..... 6.15
Munhall,Pa. U5 ..... 5.30
Newport,Ky. A2 ..... 5.30
Pittsburgh J5 ..... 5.30
Riverdale,Ill. A1 ..... 5.30
Seattle B3 ..... 6.20
Sharon,Pa. S3 ..... 5.30
S.Chicago,Ill. U5, W14 ..... 5.30
SparrowsPoint,Md. B2 ..... 5.30
Sterling,Ill. N15 ..... 5.30
Steubenville,O. W10 ..... 5.30
Warren,O. B2 ..... 5.30
Youngstown U5, Y1 ..... 5.30
Youngstown(27) R2 ..... 5.30

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 ..... 6.75
Fontana,Calif. K1 ..... 7.85
Geneva,Utah C11 ..... 7.05
Houston S5 ..... 7.15
Johnstown,Pa. B2 ..... 7.05
SparrowsPoint,Md. B2 ..... 7.05

PLATES, Wrought Iron
Economy,Pa. B14 ..... 13.55

PLATES, H.S., L.A.
Aliquippa,Pa. J5 ..... 7.95
Ashland,Ky. A10 ..... 7.95
Bessemer,Ala. T2 ..... 7.95
Clairton,Pa. U5 ..... 7.95
Claymont,Del. C22 ..... 7.95
Cleveland J5, R2 ..... 7.95
Coatesville,Pa. L7 ..... 7.95
Conshohocken,Pa. A3 ..... 7.95
Economy,Pa. B14 ..... 7.95
Ecorse,Mich. G5 ..... 7.95
Fairfield,Ala. T2 ..... 7.95
Farrell,Pa. S3 ..... 7.95
Fontana,Calif.(30) K1 ..... 8.75
Gary,Ind. U5 ..... 7.95
Geneva,Utah C11 ..... 7.95
Houston S5 ..... 8.05
Ind.Harbor,Ind. I-2, Y1 ..... 7.95
Johnstown,Pa. B2 ..... 7.95
Munhall,Pa. U5 ..... 7.95
Pittsburgh J5 ..... 7.95
Seattle B3 ..... 8.85
Sharon,Pa. S3 ..... 7.95
S.Chicago,Ill. U5, W14 ..... 7.95
SparrowsPoint,Md. B2 ..... 7.95
Warren,O. R2 ..... 7.95
Youngstown U5, Y1 ..... 7.95

PLATES, ALLOY
Aliquippa,Pa. J5 ..... 7.50
Claymont,Del. C22 ..... 7.50
Coatesville,Pa. L17 ..... 7.50
Economy,Pa. B14 ..... 7.50
Farrell,Pa. S3 ..... 7.50
Fontana,Calif. K1 ..... 8.30
Gary,Ind. U5 ..... 7.50
Houston S5 ..... 7.60
Ind.Harbor,Ind. Y1 ..... 7.50
Johnstown,Pa. B2 ..... 7.50
Lowellville,O. S3 ..... 7.50
Munhall,Pa. U5 ..... 7.50
Newport,Ky. A2 ..... 7.50
Pittsburgh J5 ..... 7.50
Seattle B3 ..... 8.40
Sharon,Pa. S3 ..... 7.50
S.Chicago,Ill. U5, W14 ..... 7.50
SparrowsPoint,Md. B2 ..... 7.50
Youngstown Y1 ..... 7.50

FLOOR PLATES
Cleveland J5 ..... 6.375
Conshohocken,Pa. A3 ..... 6.375
Ind.Harbor,Ind. I-2 ..... 6.375
Munhall,Pa. U5 ..... 6.375
Pittsburgh J5 ..... 6.375
S.Chicago,Ill. U5 ..... 6.375

PLATES, Ingot Iron
Ashland c.l.(15) A10 ..... 5.55
Ashland l.c.l.(15) A10 ..... 6.05
Cleveland c.l. R2 ..... 6.05
Warren,O. c.l. R2 ..... 6.05

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ..... 5.675
Aliquippa,Pa.(9) J5 ..... 5.675
Alton,Ill. L1 ..... 5.875
Atlanta(9) A11 ..... 5.875
Bessemer,Ala.(9) T2 ..... 5.675
Birmingham(9) C15 ..... 5.675
Buffalo(9) R2 ..... 5.675
Canton,O.(23) R2 ..... 6.15
Clairton,Pa.(9) U5 ..... 5.675
Cleveland(9) R2 ..... 5.675
Ecorse,Mich.(9) G5 ..... 5.675
Emeryville,Calif. J7 ..... 6.425
Fairfield,Ala.(9) T2 ..... 5.675
Fairless,Pa.(9) U5 ..... 5.825
Fontana,Calif.(9) K1 ..... 6.375
Gary,Ind.(9) U5 ..... 5.675
Houston(9) S5 ..... 5.925
Ind.Harbor(9) I-2, Y1 ..... 5.675
Johnstown,Pa.(9) B2 ..... 5.675
Joliet,Ill. P22 ..... 5.675
KansasCity,Mo.(9) S5 ..... 5.925
Lackawanna(9) B2 ..... 5.675
LosAngeles(9) B3 ..... 6.375
Massillon,O.(23) R2 ..... 6.15
Midland,Pa.(23) C18 ..... 6.025
Milton,Pa. M18 ..... 5.825
Minnequa,Colo. C10 ..... 6.125
Niles,Calif. P1 ..... 6.375
N.Tonawanda,N.Y.(23) B11 ..... 6.025
Owensboro,Ky.(9) G8 ..... 6.025
Pittsburg,Calif.(9) C11 ..... 6.375
Pittsburgh(9) J5 ..... 5.675
Portland,Oreg. O4 ..... 6.425
Riverdale,Ill.(9) A1 ..... 5.675
Seattle B3, N14 ..... 6.425
S.Ch'e'go(9) R2,U5,W14 ..... 5.675
S.Duquesne,Pa.(9) U5 ..... 5.675
S.SanFran.,Calif.(9) B3 ..... 6.425
Sterling,Ill.(1)(9) N15 ..... 5.675
Sterling,Ill.(9) N15 ..... 5.775
Struthers,O.(9) Y1 ..... 5.675
Tonawanda,N.Y. B12 ..... 5.675
Torrance,Calif.(9) C11 ..... 6.375
Warren,O. C17 ..... 6.025
Youngstown(9) R2, U5 ..... 5.675

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 ..... 6.725
Bethlehem,Pa. B2 ..... 6.725
Bridgeport,Conn. C32 ..... 6.80
Buffalo R2 ..... 6.725
Canton,O. R2, T7 ..... 6.725
Clairton,Pa. U5 ..... 6.725
Detroit S41 ..... 6.725
Economy,Pa. B14 ..... 6.725
Ecorse,Mich. G5 ..... 6.725
Fairless,Pa. U5 ..... 6.875
Farrell,Pa. S3 ..... 6.725
Fontana,Calif. K1 ..... 7.775
Gary,Ind. U5 ..... 6.725
Houston S5 ..... 6.975
Ind.Harbor,Ind. I-2, Y1 ..... 6.725
Johnstown,Pa. B2 ..... 6.725
KansasCity,Mo. S5 ..... 6.975
Lackawanna,N.Y. B2 ..... 6.725
LosAngeles B3 ..... 7.775
Lowellville,O. S3 ..... 6.725
Massillon,O. R2 ..... 6.725
Midland,Pa. C18 ..... 6.725
Owensboro,Ky. G8 ..... 6.725
Pittsburgh J5 ..... 6.725
Sharon,Pa. S3 ..... 6.725
S.Chicago R2, U5, W14 ..... 6.725
S.Duquesne,Pa. U5 ..... 6.725
Struthers,O. Y1 ..... 6.725
Warren,O. C17 ..... 6.725
Youngstown U5 ..... 6.725

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 ..... 8.30
Bessemer,Ala. T2 ..... 8.30
Bethlehem,Pa. B2 ..... 8.30
Clairton,Pa. U5 ..... 8.30
Cleveland R2 ..... 8.30
Ecorse,Mich. G5 ..... 8.30
Fairfield,Ala. T2 ..... 8.30
Fontana,Calif. K1 ..... 9.00
Gary,Ind. U5 ..... 8.30
Houston S5 ..... 8.55
Ind.Harbor,Ind. Y1 ..... 8.30
Johnstown,Pa. B2 ..... 8.30
KansasCity,Mo. S5 ..... 8.55
Lackawanna,N.Y. B2 ..... 8.30
LosAngeles B3 ..... 9.00
Pittsburgh J5 ..... 8.30
Seattle B3 ..... 9.05
S.Chicago,Ill. R2, W14 ..... 8.30
S.Duquesne,Pa. U5 ..... 8.30
S.SanFrancisco B3 ..... 9.05
Struthers,O. Y1 ..... 8.30
Youngstown U5 ..... 8.30

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ..... 5.825
Houston(9) S5 ..... 5.925
KansasCity,Mo.(9) S5 ..... 5.925
Lackawanna(9) B2 ..... 5.675
Sterling,Ill. N15 ..... 5.775
Sterling,Ill.(1) N15 ..... 5.675
Tonawanda,N.Y. B12 ..... 5.675

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 ..... 5.675
Atlanta A11 ..... 5.875
Joliet,Ill. P22 ..... 5.675
Minnequa,Colo. C10 ..... 6.125
Niles,Calif. P1 ..... 6.375
Pittsburgh J5 ..... 5.675
Portland,Oreg. O4 ..... 6.425
SanFrancisco S7 ..... 6.52
Seattle B3 ..... 6.425

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 ..... 6.80
Clairton,Pa. U5 ..... 6.80
Gary,Ind. U5 ..... 6.80
Houston S5 ..... 7.05
KansasCity,Mo. S5 ..... 7.05
Pittsburgh J5 ..... 6.80
Youngstown U5 ..... 6.80

BARS, C.F. Leaded (Including leaded extra)
Carbon
LosAngeles P2, S30 ..... 11.75*
Alloy
Ambridge,Pa. W18 ..... 10.175
BeaverFalls,Pa. M12 ..... 10.175
Camden,N.J. P13 ..... 10.35
Chicago W18 ..... 10.175
Elyria,O. W8 ..... 10.175
Monaca,Pa. S17 ..... 10.175
Newark,N.J. W18 ..... 10.35
SpringCity,Pa. K3 ..... 10.35

*Grade A; add 0.050c for Grade B.

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ..... 7.65
BeaverFalls,Pa. M12,R2 ..... 7.65
Birmingham C15 ..... 8.25
Buffalo B5 ..... 7.70
Camden,N.J. P13 ..... 8.10
Carnegie,Pa. C12 ..... 7.65
Chicago W18 ..... 7.65
Cleveland A7, C20 ..... 7.65
Detroit B5, P17 ..... 7.85
Detroit S41 ..... 7.65
Donora,Pa. A7 ..... 7.65
Elyria,O. W8 ..... 7.65
FranklinPark,Ill. N5 ..... 7.65
Gary,Ind. R2 ..... 7.65
GreenBay,Wis. F7 ..... 7.65
Hammond,Ind. J5, L2 ..... 7.65
Hartford,Conn. R2 ..... 8.15
Harvey,Ill. B5 ..... 7.65
LosAngeles(49) S30 ..... 9.10
LosAngeles(49) P2, R2 ..... 9.10
Mansfield,Mass. B2 ..... 8.20
Massillon,O. R2, R8 ..... 7.65
Midland,Pa. C18 ..... 7.65
Monaca,Pa. S17 ..... 7.65
Newark,N.J. W18 ..... 8.10
NewCastle,Pa.(17) B4 ..... 7.65
Pittsburgh J5 ..... 7.65
Plymouth,Mich. P5 ..... 7.90
Putnam,Conn. W18 ..... 8.20
Readville,Mass. C14 ..... 8.20
S.Chicago,Ill. , W14 ..... 7.65
SpringCity,Pa. K3 ..... 8.10
Struthers,O. Y1 ..... 7.65
Warren,O. C17 ..... 7.65
Waukegan,Ill. A7 ..... 7.65
Willimantic,Conn. J5 ..... 8.15
Youngstown F3, Y1 ..... 7.65

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19 ..... 6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ..... 9.025
BeaverFalls,Pa. M12,R2 ..... 9.025
Bethlehem,Pa. B2 ..... 9.025
Bridgeport,Conn. C32 ..... 9.175
Buffalo B5 ..... 9.025
Camden,N.J. P13 ..... 9.20
Canton,O. T7 ..... 9.025
Carnegie,Pa. C12 ..... 9.025
Chicago W18 ..... 9.025
Cleveland A7, C20 ..... 9.025
Detroit B5, P17 ..... 9.225
Detroit S41 ..... 9.025
Donora,Pa. A7 ..... 9.025
Elyria,O. W8 ..... 9.025
FranklinPark,Ill. N5 ..... 9.025
Gary,Ind. R2 ..... 9.025
GreenBay,Wis. F7 ..... 9.025
Hammond,Ind. J5, L2 ..... 9.025
Hartford,Conn. R2 ..... 9.325
Harvey,Ill. B5 ..... 9.025
Lackawanna,N.Y. B2 ..... 9.025
LosAngeles P2, S30 ..... 11.00
Mansfield,Mass. B5 ..... 9.325
Massillon,O. R2, R8 ..... 9.025
Midland,Pa. C18 ..... 9.025
Monaca,Pa. S17 ..... 9.025
Newark,N.J. W18 ..... 9.20
Plymouth,Mich. P5 ..... 9.225
S.Chicago,Ill. W14 ..... 9.025
SpringCity,Pa. K3 ..... 9.20
Struthers,O. Y1 ..... 9.025
Warren,O. C17 ..... 9.025
Waukegan,Ill. A7 ..... 9.025
Willimantic,Conn. J5 ..... 9.325
Worcester,Mass. A7 ..... 9.325
Youngstown F3, Y1 ..... 9.025

BARS, Reinforcing, Billet (To Fabricators)

AlabamaCity,Ala. R2 ..5.675
Atlanta A11 .....5.675
Birmingham C15 .....5.675
Buffalo R2 .....5.675
Cleveland R2 .....5.675
Ecorse,Mich. G5 .....5.675
Emeryville,Calif. J7 ...6.425
Fairfield,Ala. T2 .....5.675
Fairless Pa. U5 .....5.825
Fontana,Calif. K1 ....6.375
Ft.Worth,Tex.(4)(26)T4 6.125
Gary,Ind. U5 .....5.675
Houston S5 .....5.925
Ind.Harbor,Ind. I-2, Y1 5.675
Johnstown,Pa. B2 .....5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo. S5 ....5.925
Kokomo,Ind. C16 .....5.775
Lackawanna,N.Y. B2 ..5.675
LosAngeles B3 .....6.375
Madison,Ill. L1 .....5.875
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ...6.125
Niles,Calif. P1 .....6.375
Pittsburg,Calif. C11 ..6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 .....6.425
SandSprings,Okla. S5 ..5.925
Seattle B3, N14 .....6.425
S.Chicago,Ill. R2, W14 .5.675
S.Duquesne,Pa. U5 ....5.675
S.SanFrancisco B3 ....6.425
SparrowsPoint,Md. B2 ..5.675
Sterling,Ill.(1) N15 ....5.675
Sterling,Ill. N15 .....5.775
Struthers,O. Y1 .....5.675
Tonawanda,N.Y. B12 ...6.10
Torrance,Calif. C11 ...6.375
Youngstown R2, U5 ...5.675

BARS, Reinforcing, Billet (Fabricated to Consumers)

Baltimore B2 .....7.42
Boston B2, U8 .....8.15
Chicago U8 .....7.41
Cleveland U8 .....7.39
Houston S5 .....7.60
Johnstown Pa. B2 .....7.33
KansasCity,Mo. S5 .....7.60
Lackawanna,N.Y. B2 ..7.35
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.80
Philadelphia U8 .....7.63
Pittsburgh J5, U8 .....7.35
SandSprings,Okla. S5 ...7.60
Seattle B3, N14 .....7.95
SparrowsPt.,Md. B2 ...7.33
St. Paul U8 .....8.17
Williamsport,Pa. S19 ...7.25

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.90
Economy,Pa.(D.R.)B14 18.55
Economy(Staybolt)B14 19.00

BARS, Rail Steel

ChicagoHts.(3) C2, I-2 .5.575
ChicagoHts.(4)(44) I-2 ..5.675
ChicagoHts.(4) C2 ....5.675
Franklin,Pa.(3) F5 ....5.575
Franklin,Pa.(4) F5 ....5.675
JerseyShore,Pa.(3) J8 ..5.55
Marion,O.(3) P11 ....5.575
Tonawanda(3) B12 ....5.575
Tonawanda(4) B12 .....6.10

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

AlabamaCity,Ala. R2 ...5.10
Allenport,Pa. P7 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky.(8) A10 ....5.10
Cleveland J5, R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit(8) M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Fairless,Pa. U5 .....5.15
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 .....5.825
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.20
GraniteCity,Ill.(8) G4 ..5.20
Ind.Harbor,Ind. I-2, Y1 .5.10
Irvin,Pa. U5 .....5.10
Lackawanna,N.Y. B2 ..5.10
Mansfield,O. E6 .....5.10
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Niles,O. M21, S3 .....5.10
Pittsburg,Calif. C11 ....5.80
Pittsburgh J5 .....5.10
Portsmouth,O. P12 .....5.10
Riverdale,Ill. A1 .....5.10
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14 ..5.10
SparrowsPoint,Md. B2 ..5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Weirton,W.Va. W6 .....5.10
Youngstown U5, Y1 ....5.10

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21, S3 .....6.275

SHEETS, H.R. Alloy

Gary,Ind. U5 .....8.40
Ind.Harbor,Ind. Y1 .....8.40
Irvin,Pa. U5 .....8.40
Munhall,Pa. U5 .....8.40
Newport,Ky. A2 .....8.40
Youngstown U5, Y1 ....8.40

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....7.525
Ashland,Ky. A10 .....7.525
Cleveland J5, R2 .....7.525
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 .....7.525
Fairless,Pa. U5 .....7.575
Farrell,Pa. S3 .....7.525
Fontana,Calif. K1 .....8.25
Gary,Ind. U5 .....7.525
Ind.Harbor,Ind. I-2, Y1 .7.525
Irvin,Pa. U5 .....7.525
Lackawanna(35) B2 ....7.525
Munhall,Pa. U5 .....7.525
Niles,O. S3 .....7.525
Pittsburgh J5 .....7.525
S.Chicago,Ill. U5, W14 .7.525
Sharon,Pa. S3 .....7.525
SparrowsPoint(36) B2..7.525
Warren,O. R2 .....7.525
Weirton,W.Va. W6 ....7.525
Youngstown U5, Y1 ..7.525

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland Ky.(8) A10 ....5.35
Cleveland R2 .....5.875
Warren,O. R2 .....5.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....7.05
Middletown,O. A10 ...6.775
Warren,O. R2 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 ..6.275
Allenport,Pa. P7 .....6.275
Aliquippa,Pa. J5 .....6.275
Cleveland J5, R2 .....6.275
Conshohocken,Pa. A3 ..6.325
Detroit M1 .....6.275
Ecorse,Mich. G5 .....6.275
Fairfield Ala. T2 .....6.275
Fairless,Pa. U5 .....6.325
Follansbee,W.Va. F4 ..6.275
Fontana,Calif. K1 .....7.40
Gary,Ind. U5 .....6.275
GraniteCity,Ill. G4 ....6.375
Ind.Harbor,Ind. I-2, Y1 .6.275
Irvin,Pa. U5 .....6.275
Lackawanna,N.Y. B2 ..6.275
Mansfield,O. E6 .....6.275
Middletown,O. A10 ....6.275
Newport,Ky. A2 .....6.275
Pittsburg,Calif. C11 ...7.225
Pittsburgh J5 .....6.275
Portsmouth,O. P12 ....6.275
SparrowsPoint,Md. B2..6.275
Steubenville,O. W10 ...6.275
Warren,O. R2 .....6.275
Weirton,W.Va. W6 ....6.275
Yorkville,O. W10 .....6.275
Youngstown Y1 .....6.275

SHEETS, Cold-Rolled, High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....9.275
Cleveland J5, R2 .....9.275
Ecorse,Mich. G5 .....9.275
Fairless,Pa. U5 .....9.325
Fontana,Calif. K1 .....10.40
Gary,Ind. U5 .....9.275
Ind.Harbor,Ind. I-2, Y1 .9.275
Irvin,Pa. U5 .....9.275
Lackawanna(37) B2 ...9.275
Pittsburgh J5 .....9.275
SparrowsPoint(38) B2..9.275
Warren,O. R2 .....9.275
Weirton,W.Va. W6 ....9.275
Youngstown Y1 .....9.275

SHEETS, Culvert

	Cu Steel	Cu Fe
Ala.City,Ala. R2	7.225	....
Ashland,Ky. A10	7.225	7.475
Canton,O. R2	7.225	7.75
Fairfield T2	7.225	7.475
Gary,Ind. U5	7.225	7.475
GraniteCity,Ill.G4	7.325	....
Ind.Harbor I-2	7.225	7.475
Irvin Pa. U5	7.225	7.475
Kokomo,Ind. C16	7.325	....
MartinsFry. W10	7.225	7.475
Pitts.,Calif. C11	7.975	....
SparrowsPt. B2	7.225	....
Pittsburgh J5	7.225	....

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ...7.475

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2 .6.875‡
Ashland,Ky. A10 .....6.875†
Canton,O. R2 .....6.875‡
Dover,O. E6 .....6.875†
Fairfield,Ala. T2 ....6.875†
Gary Ind. U5 .....6.875†
GraniteCity,Ill. G4 ...6.975*
Ind.Harbor,Ind. I-2 ..6.875†
Irvin,Pa. U5 .....6.875†
Kokomo,Ind. C16 ....6.975‡
MartinsFerry,O. W10 .6.875*
Middletown,O. A10 ....6.875†
Pittsburg,Calif. C11 ..7.625*
Pittsburgh J5 .....6.875†
SparrowsPt.,Md. B2 ..6.875†
Warren,O. R2 .....6.875†
Weirton,W.Va. W6 ...6.875*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.325

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....10.125
SparrowsPt.(39) B2 ..10.025
Pittsburgh J5 .....10.125

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.275
Irvin,Pa. U5 .....7.275

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....7.125
Middletown,O. A10 ....7.125

SHEETS, Electrogalvanized

Cleveland(28) R2 .....7.65
Niles,O.(28) R2 .....7.65
Youngstown J5 .....7.50
Weirton,W.Va. W6 .....7.50

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 9.525
Butler,Pa. A10 (type 2) 9.625

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.775
Cleveland R2 .....6.775
Fairfield,Ala. T2 .....6.775
Gary,Ind. U5 .....6.775
GraniteCity,Ill. G4 ....6.875
Ind.Harbor,Ind. I-2,Y1 .6.775
Irvin Pa. U5 .....6.775
Middletown,O. A10 ....6.775
Niles,O. M21, S3 .....6.775
Youngstown Y1 .....6.775

BLUED STOCK, 29 Gage

Dover,O. E6 .....8.70
Follansbee,W.Va. F4 ...8.70
Ind.Harbor,Ind. I-2 ....8.70
Mansfield,O. E6 .....8.70
Warren,O. R2 .....8.70
Yorkville,O. W10 .....8.70

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.225
Gary,Ind. U5 .....7.225
Mansfield,O. E6 .....7.225
Middletown,O. A10 ....7.225
Niles,O. M21, S3 .....7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225

SHEETS, Long Terne, Ingot Iron

Middletown,O., A10 ....7.625

Key To Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div. Buffalo Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.

D2 Detroit Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.
E10 Enamel Prod. & Plating

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Special Wire
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.
N20 Neville Ferro Alloy Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co., Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless & Strip Div., J&L Steel Corp.
S12 Southern Elec. Steel Co.

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U3 Union Wire Rope Corp.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Steel Div., Associated Spring Corp.
W2 Wallingford Steel Corp.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	5.10
Allenport,Pa. P7	5.10
Alton,Ill. L1	5.30
Ashland,Ky.(8) A10	5.10
Atlanta A11	5.10
Bessemer,Ala. T2	5.10
Birmingham C15	5.10
Buffalo(27) R2	5.10
Conshohocken,Pa. A3	5.15
Detroit M1	5.10
Ecorse,Mich. G5	5.10
Fairfield,Ala. T2	5.10
Farrell,Pa. S3	5.10
Fontana,Calif. K1	5.825
Gary,Ind. U5	5.10
Ind.Harbor,Ind. I-2, Y1	5.10
Johnstown,Pa.(25) B2	5.10
Lackaw'na,N.Y.(25) B2	5.10
LosAngeles(25) B3	5.85
LosAngeles C1	8.60
Minnequa,Colo. C10	6.20
Riverdale,Ill. A1	5.10
SanFrancisco S7	6.60
Seattle(25) B3	6.10
Seattle N14	6.60
Sharon,Pa. S3	5.10
S.Chicago W14	5.10
S.SanFrancisco(25) B3	5.85
SparrowsPoint,Md. B2	5.10
Torrance,Calif. C11	5.85
Warren,O. R2	5.10
Weirton,W.Va. W6	5.10
Youngstown U5	5.10

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18	8.40
Farrell,Pa. S3	8.40
Gary,Ind. U5	8.40
Houston S5	8.65
Ind.Harbor,Ind. Y1	8.40
KansasCity,Mo. S5	8.65
LosAngeles B3	9.60
Lowellville,O. S3	8.40
Newport,Ky. A2	8.40
Sharon,Pa. A2, S3	8.40
S.Chicago,Ill. W14	8.40
Youngstown U5, Y1	8.40

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland,Ky. A10	7.575
Bessemer,Ala. T2	7.575
Conshohocken,Pa. A3	7.575
Ecorse,Mich. G5	7.575
Fairfield,Ala. T2	7.575
Farrell,Pa. S3	7.575
Gary,Ind. U5	7.575
Ind.Harbor,Ind. I-2,Y1	7.575
Lackawanna,N.Y. B2	7.575
LosAngeles(25) B3	8.325
Seattle(25) B3	8.575
Sharon,Pa. S3	7.575
S.Chicago,Ill. W14	7.575
S.SanFrancisco(25) B3	8.325
SparrowsPoint,Md. B2	7.575
Warren,O. R2	7.575
Weirton,W.Va. W6	7.575
Youngstown U5, Y1	7.575

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	5.35
Warren,O. R2	5.875

STRIP, Cold-Rolled Carbon

Anderson,Ind G6	7.425
Baltimore T6	7.425
Boston T6	7.975
Buffalo S40	7.425
Cleveland A7, J5	7.425
Dearborn,Mich. S3	7.425
Detroit D2, M1, P20	7.425
Dover, O. G6	7.425
Evanston,Ill. M22	7.525
Farrell, Pa. S3	7.425
Follansbee,W.Va. F4	7.425
Fontana,Calif. K1	9.20
FranklinPark,Ill. T6	7.525
Ind.Harbor,Ind. Y1	7.425
Indianapolis S41	7.575
LosAngeles C1, S41	9.30
McKeesport,Pa. E10	7.525
NewBedford,Mass. R10	7.875
NewBritain,Conn. S15	7.875
NewCastle,Pa. B4, E5	7.425
NewHaven,Conn. D2	7.875
NewKensington,Pa. A6	7.425
Pawtucket,R.I. R3	7.975
Pawtucket,R.I. N8	7.975
Philadelphia P24	7.875
Pittsburgh J5	7.425
Riverdale,Ill. A1	7.525
Rome,N.Y.(32) R6	7.425
Sharon,Pa. S3	7.425
Trenton,N.J.(31) R5	8.875
Wallingford,Conn. W2	7.875
Warren,O. R2, T5	7.425
Worcester,Mass. A7	7.975
Youngstown S41, Y1	7.425

STRIP, Cold-Rolled Alloy

Boston T6	15.90
Carneigie,Pa. S18	15.55
Cleveland A7	15.55
Dover,O. G6	15.55
Farrell,Pa. S3	15.55
FranklinPark,Ill. T6	15.55
Harrison,N.J. C18	15.55
Indianapolis S41	15.70
LosAngeles S41	17.75
Lowellville,O. S3	15.55
Pawtucket,R.I. N8	15.90
Riverdale,Ill. A1	15.55
Sharon,Pa. S3	15.55
Worcseter,Mass. A7	15.85
Youngstown S41	15.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.80
Dearborn,Mich. S3	10.80
Dover,O. G6	10.80
Farrell,Pa. S3	10.80
Ind.Harbor,Ind. Y1	10.80
Sharon,Pa. S3	10.80
Warren,O. R2	10.80

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carneigie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. S3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	....
Farrell,Pa. S3	8.95	10.40	12.60	15.60	18.55
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	12.90	16.10	19.30
Indianapolis S41	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles S41	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	8.95	10.40	12.60	15.60	....
New York W3	....	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	....	10.70	12.90	15.90	18.85
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown S41	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)

	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol, Conn. W1	18.85	22.95	27.80
Buffalo W12	18.85	....	....
Fostoria,O. S1	19.05	22.15	....
FranklinPark,Ill. T6	19.20	23.30	28.15
Harrison,N.J. C18	18.85	22.95	27.80
NewYork W3	18.85	22.95	27.80
Palmer,Mass. W12	18.85	....	....
Trenton,N.J. R5	18.85	22.95	27.80
Worcester,Mass. A7, T6	18.85	22.95	27.80
Youngstown S41	19.20	23.30	28.15

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$9.10	$9.35	$9.75
Fairfield,Ala. T2	9.20	9.45	9.85
Fairless,Pa. U5	9.20	9.45	9.85
Fontana,Calif. K1	9.75	10.00	10.40
Gary,Ind. U5	9.10	9.35	9.75
GraniteCity,Ill. G4	9.20	9.45	9.60
IndianaHarbor,Ind. I-2, Y1	9.10	9.35	9.75
Irvin,Pa. U5	9.10	9.35	9.75
Niles,O. R2	9.10	9.35	9.75
Pittsburg,Calif. C11	9.75	10.00	10.40
SparrowsPoint,Md. B2	9.10	9.35	9.75
Yorkville,O. W10	9.10	9.35	9.75

ELECTROLYTIC TIN-COATED SHEET (20-27 Ga.; Dollars per 100 lb)		
Aliquippa,Pa. J5	*7.90*	*8.10*
Niles,O. R2	7.725	7.925 8.125

TIN PLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa.J5	$10.40	$10.65
Fairfield,Ala. T2	10.50	10.75
Fairless,Pa. U5	10.50	10.75
Fontana,Calif.K1	11.05	11.30
Gary,Ind. U5	10.40	10.65
Ind.Harb. Y1	10.40	10.65
Pitts.,Calif. C11	11.05	11.30
Sp.Pt.,Md. B2	10.40	10.65
Weirton,W.Va.W6	10.40	10.65
Yorkville,O. W10	10.40	10.65

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$8.20
Fairfield,Ala. T2	8.30
Fairless,Pa. U5	8.30
Fontana,Calif. K1	8.85
Gary,Ind. U5	8.20
GraniteCity,Ill. G4	8.30
Ind.Harbor,Ind. I-2, Y1	8.20
Irvin,Pa. U5	8.20
Niles,O. R2	8.20
Pittsburg,Calif. C11	8.85
SparrowsPoint,Md. B2	8.25
Weirton,W.Va. W6	8.20
Yorkville,O. W10	8.20

HOLLOWARE ENAMELING Black Plate (29 Gage)	
Aliquippa,Pa. J5	7.85
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. Y1	7.85
Irvin,Pa. U5	7.85
Yorkville,O. W10	7.85

MANUFACTURING TERNES (Special Coated, Base Box)	
Gary,Ind. U5	$9.70
Irvin,Pa. U5	9.70

ROOFING SHORT TERNES (8 lb Coated, Base Box)	
Gary,Ind. U5	$11.25

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	8.175

STRIP, C.R. Electrogalvanized

Cleveland A7	7.425*
Dover,O. G6	7.425*
Evanston,Ill. M22	7.525*
McKeesport,Pa. E10	7.50*
Riverdale,Ill. A1	7.525*
Warren,O. B9, S3, T5	7.425*
Worcester,Mass. A7	7.975
Youngstown S41	7.425*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Farrell,Pa. S3	7.50
Sharon,Pa. S3	7.50

TIGHT COOPERAGE HOOP

Atlanta A11	5.65
Farrell,Pa. S3	5.525
Riverdale,Ill. A1	5.675
Sharon,Pa. S3	5.525
Youngstown U5	5.525

SILICON STEEL

C.R. COILS & CUT LENGTHS (22 Ga.) Fully Processed (Semiprocessed ½c lower)	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom,W.Va. W10	....	11.70	12.40	13.55	14.65
Brackenridge,Pa. A4	....	....	12.40	13.55	14.65
GraniteCity,Ill. G4	9.975*	11.30*	12.00*	13.15*	....
IndianaHarbor,Ind. I-2	9.875*	11.20*	11.90*	13.05*	....
Mansfield,O. E6	9.875*	11.70	12.40	13.55	14.55
Newport,Ky. A2	9.875	11.70*	12.40*	13.55*	14.65*
Niles,O. M21	9.875*	11.70	12.40	13.55	....
Vandergrift,Pa. U5	9.875*	11.70	12.40	13.55	14.65
Warren,O. R2	9.875*	11.70	12.40	13.55	14.65
Zanesville,O. A10	....	11.70†	12.40	13.55	14.65

	Stator
Vandergrift,Pa. U5	8.10
Mansfield,O E6	8.10

SHEETS (22 Ga., coils & cut lengths) Fully Processed (Semiprocessed ½c lower)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.70	16.30	16.80	17.85
Vandergrift,Pa. U5	15.70	16.30	16.80	17.85
Zanesville,O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	18.10	19.70	20.20	20.70	15.70††	
Butler,Pa. A10	....	....	19.70	20.20	20.70	....
Vandergrift,Pa. U5	17.10	18.10	19.70	20.20	20.70	15.70
Warren,O. R2	....	....	....	....	....	15.70‡

*Semiprocessed. † Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. ††Coils only.

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	8.00
Aliquippa,Pa. J5	8.00
Alton,Ill. L1	8.20
Atlanta A1	8.00
Bartonville,Ill. K4	8.10
Buffalo W12	8.00
Chicago W13	8.00
Cleveland A7, C20	8.00
Crawfordsville,Ind. M8	8.10
Donora,Pa. A7	8.00
Duluth A7	8.00
Fairfield,Ala. T2	8.00
Fostoria,O.(24) S1	8.10
Houston S5	8.25
Jacksonville,Fla. M8	8.35
Johnstown,Pa. B2	8.00
Joliet,Ill. A7	8.00
KansasCity,Mo. S5	8.25
Kokomo,Ind. C16	8.10
LosAngeles B3	8.95
Minnequa,Colo. C10	8.25
Monessen,Pa. P7, P16	8.00
N.Tonawanda,N.Y. B11	8.00
Palmer,Mass. W12	8.30
Pittsburg,Calif. C11	8.95
Portsmouth,O. P12	8.00
Rankin,Pa. A7	8.00
S.Chicago,Ill. R2	8.00
S.SanFrancisco C10	8.95
SparrowsPoint,Md. B2	8.10
Sterling,Ill.(1) N15	8.00
Sterling,Ill. N15	8.10
Struthers,O. Y1	8.00
Waukegan,Ill. A7	8.00
Worcester,Mass. A7	8.30

WIRE, Cold Heading Carbon

Elyria,O. W8	8.00

WIRE, Gal'd., for ACSR

Bartonville,Ill K4	12.65
Buffalo W12	13.40
Cleveland A7	12.65
Donora,Pa. A7	12.65
Duluth A7	12.65
Johnstown,Pa. B2	13.40
Minnequa,Colo. C10	12.775
Monessen,Pa. P7, P16	12.65
Muncie,Ind. I-7	13.60
NewHaven,Conn. A7	12.95
Palmer,Mass. W12	13.70
Pittsburg,Calif. C11	13.45
Portsmouth,O. P12	12.65
Roebling,N.J. R5	12.95
SparrowsPt.,Md. B2	13.50
Struthers,O. Y1	13.40
Trenton,N.J. A7	12.95
Waukegan,Ill. A7	12.65
Worcester,Mass. A7	12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	9.75
Alton,Ill. L1	9.95
Buffalo W12	9.75
Cleveland A7	9.75
Donora,Pa. A7	9.75
Duluth A7	9.75
Johnstown,Pa. B2	9.75
KansasCity,Mo. S5	10.00
LosAngeles B3	10.70
Minnequa,Colo. C10	9.95
Monessen,Pa. P7, P16	9.75
NewHaven,Conn. A7	10.05
Palmer,Mass. W12	10.05
Pittsburg,Calif. C11	10.70
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
S.Chicago,Ill. R2	9.75
S.SanFrancisco C10	10.70
SparrowsPt., Md. B2	9.85
Struthers,O. Y1	9.75
Trenton,N.J. A7	10.05
Waukegan,Ill. A7	10.05

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5	9.75
Alton,Ill. L1	9.95
Bartonville,Ill. K4	9.85
Buffalo W12	9.75
Cleveland A7	9.75
Donora,Pa. A7	9.75
Duluth A7	9.75
Fostoria,O. S1	9.80
Johnstown,Pa. B2	9.75
KansasCity,Mo. S5	10.00
LosAngeles B3	10.70
Milbury,Mass.(12) N6	10.05
Minnequa,Colo. C10	9.95
Monessen,Pa. P7, P16	9.75
Muncie,Ind. I-7	9.95
Palmer,Mass. W12	10.05
Pittsburg,Calif. C11	10.70
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
S.Chicago,Ill. R2	9.75
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	9.85
Struthers,O. Y1	9.75
Trenton,N.J. A7	10.05
Waukegan,Ill. A7	9.75
Wor'ster,Mass.A7,J4T6	10.05

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1	16.50
Bartonville,Ill. K4	16.40
Chicago W13	16.30
Cleveland A7	16.30
Crawfordsville,Ind. M8	16.40
Fostoria,O. S1	16.30
Houston S5	16.55
Jacksonville,Fla. M8	16.65
Johnstown,Pa. B2	16.30
KansasCity,Mo. S5	16.55
Kokomo,Ind. C16	16.30
Minnequa,Colo. C10	16.55
Monessen,Pa. P16	16.30
Muncie,Ind. I-7	16.50
Palmer,Mass. W12	16.60
S.SanFrancisco C10	17.15
Waukegan,Ill. A7	16.30
Worcester,Mass. A7, J6	16.60

WIRE, Tire Bead

Bartonville,Ill. K4	17.15
Monessen,Pa. P16	17.15
Roebling,N.J. R5	17.65

ROPE WIRE (A)

Bartonville,Ill. K4	13.45
Buffalo W12	13.45
Fostoria,O. S1	13.45
Johnstown,Pa. B2	13.45
Monessen,Pa. P7	13.45
Muncie,Ind. I-7	13.65
Palmer,Mass. W12	13.75
Portsmouth,O. P12	13.45
Roebling,N.J. R5	13.75
St.Louis L8	12.75
SparrowsPt.,Md. B2	13.55
Struthers,O. Y1	13.45
Worcester,Mass. J4	13.75

(A) Plow and Mild Plow; add 0.25c for Improved Plow

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	12.35
Baltimore T6	12.65
Boston T6	12.65
Buffalo W12	12.35
Chicago W13	12.45
Cleveland A7	12.35
Crawfordsville,Ind. M8	12.35
Dover,O. G6	12.35
Farrell,Pa. S3	11.65
Fostoria,O. S1	12.35
FranklinPark,Ill. T6	12.45
Kokomo,Ind. C16	12.35
Massillon,O. R8	12.35
Milwaukee C23	12.55
Monessen,Pa. P7, P16	12.35
Palmer,Mass. W12	12.65
Pawtucket,R.I. N8	11.95
Philadelphia P24	12.65
Riverdale,Ill. A1	12.45
Rome,N. Y. R6	12.35
Sharon,Pa. S3	12.35
Trenton,N.J. R5	12.65
Warren,O. B9	12.35
Worcester,Mass. A7,T6	12.65

NAILS, Stock — **Col.**

AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla. M8	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity,Mo. S5	175
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	179

(To Wholesalers; per cwt)

Galveston,Tex. D7 ....$10.30

NAILS, Cut (100 lb keg)
To Dealers (33)

Wheeling,W.Va. W10 ..$9.80

POLISHED STAPLES — **Col.**

AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	173
Atlanta A11	177
Bartonville,Ill. K4	177
Crawfordsville,Ind. M8	177
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	180
Jacksonville,Fla. M8	177
Johnstown,Pa. B2	175
Joliet,Ill. A7	173
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	173
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.) (per 97 lb Net Box) Coil No. 3150

AlabamaCity,Ala. R2	$10.26
Atlanta A11	10.36
Bartonville,Ill. K4	10.36
Buffalo W12	10.26
Chicago W13	10.26
Crawfordsville,Ind. M8	10.36
Donora,Pa. A7	10.26
Duluth A7	10.26
Fairfield,Ala. T2	10.26
Houston S5	10.51
Jacksonville,Fla. M8	10.36
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	10.26
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	10.36
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	11.04
S.Chicago,Ill. R2	10.26
S SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill. (37) N15	10.36

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$10.60
Atlanta A11	10.70
Bartonville,Ill. K4	10.70
Buffalo W12	10.60
Chicago W13	10.60
Crawfordsville,Ind. M8	10.70
Donora,Pa. A7	10.60
Duluth A7	10.60
Fairfield,Ala. T2	10.60
Houston S5	10.85
Jacksonville Fla. M8	10.70
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	10.60
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	10.70
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	11.40
S. Chicago,Ill. R2	10.60
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill.(37) N15	10.70

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$10.65
Atlanta A11	10.75
Bartonville Ill. K4	10.75
Buffalo W12	10.65
Chicago W13	10.65
Crawfordsville,Ind. M8	10.75
Donora,Pa. A7	10.65
Duluth A7	10.65
Fairfield,Ala. T2	10.65
Houston S5	10.90
Jacksonville,Fla. M8	10.75
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	10.65
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	10.75
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg Calif. C11	11.45
S.Chicago,Ill. R2	10.65
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill.(37) N15	10.75

BALE TIES, Single Loop — **Col.**

AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill.(7) N15	214

FENCE POSTS

Birmingham C15	172
ChicagoHts.,Ill. C2, I-2	177
Duluth A7	*177*
Franklin,Pa. F5	177
Johnstown,Pa. B2	177
Marion,O. P11	177
Minnequa,Colo. C10	*182*
Sterling,Ill.(7) N15	177
Tonawanda,N.Y. B12	172

WIRE, Barbed — **Col.**

AlabamaCity,Ala. R2	193••
Aliquippa,Pa. J5	190§
Atlanta A11	198§
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198••
Jacksonville Fla. M8	198
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198••
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198••
Monessen,Pa. P7	196§
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S Chicago,Ill R2	193••
S.SanFrancisco C10	213•
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	198††

WOVEN FENCE, 9-15 Ga. Col.

Ala.City,Ala. R2	187••
Aliq'ppa,Pa.9-11½ga.J5	190§
Atlanta A11	192§
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192••
Jacksonville,Fla. M8	192
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192••
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192••
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187••
Sterling,Ill.(7) N15	192††

WIRE (16 gage) Stone Stone An'ld Galv.

Ala.City,Ala. R2	17.85 19.40••
Aliq'ppa,Pa. J5	*17.85 19.65*
Bartonville K4	17.85 19.75
Cleveland A7	17.85
Craw'dsville M8	17.95 19.80‡‡
Fostoria,O. S1	18.35 19.90†
Houston S5	18.10 19.65••
Jacksonville M8	17.95 19.80‡‡
Johnstown B2	17.85 19.65§
Kan.City,Mo. S5	18.10
Kokomo C16	17.25 18.80†
Minnequa C10	18.10 19.65••
P'lm'r,Mass.W12	18.15 19.70†
Pitts.,Calif. C11	18.20 19.75†
S.SanFran C10	18.20 19.75••
SparrowsPt. B2	17.95 19.75§
Sterling(37) N15	17.25 19.05††
Waukegan A7	17.85 19.40†
Worcester A7	18.15

WIRE, Merchant Quality (6 to 8 gage) An'ld Galv.

Ala.City,Ala.	R2 9.00 9.55••
Aliquippa J5	8.65 9.325§
Atlanta(48)	A11 9.10 9.775§
Bartonville(48)	K4 9.10 9.775
Buffalo W12	9.00 9.55†
Cleveland A7	9.00
Crawfordsville	M8 9.10 9.80‡‡
Donora,Pa. A7	9.00 9.55†
Duluth A7	9.00 9.55†
Fairfield T2	9.00 9.55†
Houston(48) S5	9.25 9.80••
Jack'ville,Fla.	M8 9.10 9.80‡‡
Johnstown B2(48)	9.00 9.675§
Joliet,Ill A7	9.00 9.55†
Kans.City(48)	S5 9.25 9.80••
Kokomo(48) C16	9.10 9.65†
LosAngeles B3	9.95 10.625§
Monessen P7(48)	8.65 9.35§
Palmer,Mass.	W12 9.30 9.85†
Pitts.,Calif. C11	9.95 10.50†
Rankin,Pa. A7	9.00 9.55†
S Chicago B2	9.00 9.55••
S.SanFran. C10	9.95 10.50••
SparrowsPt.B2(48)	9.10 9.775§
Sterling(48) N15	9.25 9.925††
Sterling(1) (48)	9.15 9.825††
Struthers,O. Y1	9.00 9.65‡
Worcester,Mass.A7	9.30 9.85†

Based on zince price of: •13.50, †5c, ‡10c, ‡‡Less than 10c, ††10.50c, ‡‡11.00c. ••Subject to zinc equalization extras.

FASTENERS

(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill)

BOLTS

Machine Bolts
Full Size Body (cut thread)
½ in. and smaller:

3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0
Longer than 6 in.	37.0
⅝ in., 3 in. & shorter	47.0
3¼ in. thru 6 in.	40.0
Longer than 6 in.	31.0
¾ in. thru 1 in.:	
6 in. and shorter	37.0
Longer than 6 in.	31.0
1⅛ in. and larger:	
All lengths	31.0

Undersize Body (rolled thread)
½ in. and smaller:

3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0

Carriage Bolts
Full Size Body (cut thread) & Undersize Body (rolled thread)
½ in. and smaller:

6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

Lag, Plow, Tap, Blank, Step, Elevator, Tire, and Fitting Up Bolts
½ in. and smaller:

6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

High Tensile Structural Bolts
(Reg. semifinished hex head bolts, standard heavy double chamfered hex nuts. Bolts — High-carbon steel, heat treated. Spec. ASTM A-325, in bulk. Full keg quantity)

⅝ in. diam.	50.0
¾ in. diam.	47.0
⅞ and 1 in. diam.	43.0
1⅛ and 1¼ in. diam.	34.0

NUTS
(Keg or case quantity and over)

Square Nuts, Reg. & Heavy:

All sizes	56.0

(Full container)

Hex Nuts, Reg. & Heavy

Hot Pressed & Cold Punched:

⅜ in. and smaller	62.0
⅞ in. to 1⅛ in., incl.	56.0
1⅛ in. and larger	51.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

¾ in. and smaller	62.0
⅞ in. to 1½ in., incl.	56.0
1⅝ in. and larger	51.5

Hex Nuts, Finished (Incl. Slotted and Castellated):

⅞ in. and smaller	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

Semifinished Hex Nuts, Reg. (Incl. Slotted):

⅝ in. and smaller	62.0
¾ in. to ⅞ in., incl.	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

CAP AND SETSCREWS
(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Capscrews, Coarse or Fine Thread, Bright:
6 in. and shorter:

⅝ in. and smaller	35.0
¾, ⅞, and 1 in.	16.0
Longer than 6 in.:	
⅝ in. and smaller	3.0
¾, ⅞, and 1 in.	+11.0

High Carbon, Heat Treated:
6 in. and shorter:

⅝ in. and smaller	20.0
¾, ⅞, and 1 in.	+ 5.0
Longer than 6 in.:	
⅝ in. and smaller	+19.0
¾, ⅞, and 1 in.	+39.0

Flat Head Capscrews:
¾ in. and smaller, 6 in. and shorter + 85.0

Setscrews, Square Head, Cup Point, Coarse Thread:
Through 1 in. diam.:
6 in. and shorter + 5.0
Longer than 6 in. +29.0

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.85
⅞ in. and smaller by 6 in. and shorter: 15.0%

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	27.24	23.13
1¼	13	....	32.25	24.41
1½	13	30.42	35.65	26.98
1¾	13	35.94	42.12	31.89
2	13	40.28	47.21	35.74
2¼	13	45.36	53.17	40.26
2½	12	49.24	57.72	43.70
2¾	12	54.23	63.57	48.13
3	12	58.73	68.83	52.13
3½	12	62.62	73.40	55.59

RAILWAY MATERIALS

Rails	Standard No. 1	Standard No. 2	All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	5.75	5.65	....	6.725
Ensley,Ala. T2	5.75	5.65	....	6.725
Fairfield,Ala. T2	....	....	....	6.725
Gary,Ind. U5	5.75	5.65	....	....
Huntington, W Va. C15	....	....	....	6.50
Johnstown,Pa. B2	....	....	....(16)	6.725
Lackawanna,N.Y. B2	5.75	5.65	....	6.725
Minnequa,Colo. C10	5.75	5.65	....	7.22
Steelton,Pa. B2	5.75	5.65	....	....
Williamsport,Pa. S19	....	....	....	6.725

TIE PLATES

Fairfield,Ala. T2	6.875
Gary,Ind. U5	6.875
Lackawanna,N.Y. B2	6.875
Minnequa,Colo. C10	7.025
Seattle B3	7.025
Steelton,Pa. B2	6.875
Torrance,Calif. C11	6.875

JOINT BARS

Bessemer,Pa. U5	7.25
Fairfield,Ala. T2	7.25
Joliet,Ill. U5	7.25
Lackawanna,N.Y. B2	7.25
Minnequa,Colo. C10	7.25
Steelton,Pa. B2	7.25

AXLES

Ind.Harbor,Ind. S13	9.125
Johnstown,Pa. B2	9.125

TRACK BOLTS, Untreated

Cleveland R2	15.35
KansasCity,Mo. S5	15.35
Lebanon,Pa B2	15.35
Minnequa,Colo. C10	15.35
Pittsburgh P14	14.75
Seattle B3	15.85

SCREW SPIKES

Lebanon,Pa. B2	15.10

STANDARD TRACK SPIKES

Fairfield,Ala. T2	9.75
Ind.Harbor,Ind. I-2,Y1	10.10
KansasCity,Mo. S5	10.10
Lebanon,Pa. B2	10.10
Minnequa,Colo. C10	10.10
Pittsburgh J5	10.10
Seattle B3	10.60
S.Chicago,Ill. R2	10.10
Struthers,O. Y1	10.10
Youngstown K2	10.10

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1.7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Deld. in mill zone, 6.395c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.875c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 30c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.685c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 9.65c, over 3½ in. and other shapes.

KEYSTONE XL WIRE STUDY

SOLVED

Cost and Production problems by KEYSTONE XL Wire at Specialty Screw CORP.

ROCKFORD, ILLINOIS

flowability IS THE SECRET

Illustrated here are parts that were formerly expensive or difficult to manufacture. Specialty Screw Corp., Rockford, Illinois, solved these problems by switching to Keystone "XL" Wire for superior cold heading.

Read these case studies thoughtfully – see if you, like Specialty Screw, can solve difficult forming operations with "XL" Wire.

Of course, we at Keystone know that it takes much more than the finest quality wire to keep a satisfied customer. So we strive to give you the best in service – in meeting and keeping deadlines and delivery dates – in working with our customers to develop the wire exactly suited to their needs. Let us do the same for you! Call your nearby Keystone representative for complete details.

Keystone Steel & Wire Company, Peoria 7, Ill.

KEYSTONE
WIRE FOR INDUSTRY

SOLVED

high cost of manufacturing valve assembly

Formerly this part was produced on a screw machine, taking 6 operations. Now, with Keystone "XL" Wire, the part is cold headed in two blows, then shaved and threaded – 4 operations. The net result is a savings of 65% in time and material.

SOLVED

quality control on rubber vibration mount

Before "XL" was used, heads cracked and there was considerable spoilage. Now, with "XL", this part is cold headed with virtually no rejects. The head is four times the diameter of the wire.

SOLVED

die cleaning problems

In order to get square shoulders on the parts shown here, the wire can't be gummy – it must have a good, dry coating. Otherwise, the dies must be cleaned frequently. "XL" solves the problem, and saves time and money!

Keystone Steel & Wire Company
Peoria 7, Illinois

COLD HEADING FACTS FOLDER . . . send coupon today! Folder discusses uses, applications, methods, technical facts, wire requirements.

Name_____ Title_____

Company_____

Street_____

City_____ State_____

200 NEW AIR TOOLS

to help you cut fastener costs and increase output!

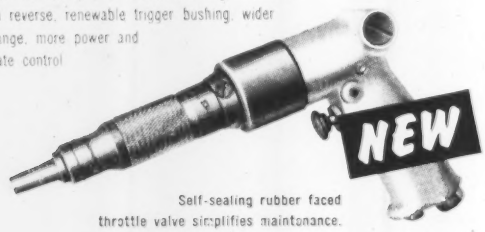
assembly machines

The ultimate in fastener and assembly efficiency—whether it's to automate a single nut running operation or a complete assembly line.

Screw driver with automatic feed for one or more screws—readily adjustable for various screw spacings.

screw drivers

More than 94 new sizes and models featuring instant push button reverse, renewable trigger bushing, wider operating range, more power and more accurate control.



Self-sealing rubber faced throttle valve simplifies maintenance.

ratchet wrenches

Designed for close quarter nut running, these wrenches combine the powerful Multi-Vane air motor with a simple, efficient ratcheting mechanism.

Like all I-R ratchet wrenches, Model 001JW can be used for removing nuts, by simply turning tool over.

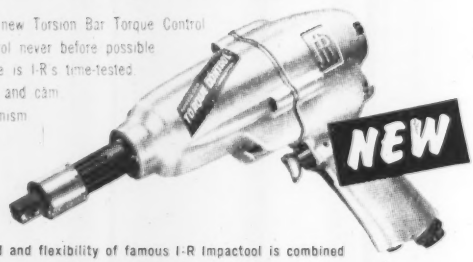
angle wrenches (torque control)

Adoption of these new Torque Control Angle Wrenches expands I-R's line, making it the most complete on the market. Unique feature is automatic torque control valve which shuts off air to the motor when nut is run to pre-determined torque.

Built in torque control is a feature of this I-R size 38PT. Torque ratings range from 5 to 100 ft. lbs.

impactools (torque control)

Revolutionary new Torsion Bar Torque Control provides control never before possible. Basic principle is I-R's time-tested exclusive ball and cam impact mechanism.



Speed and flexibility of famous I-R Impactool is combined with maximum torque control in this Model 5040T.

Easiest way for you to cut production costs and increase man-hour output is with new, more efficient air tools. Tools shown here are representative of the more than 200 new, more productive tools added to the I-R line in the past two years. Power increases ranging up to 75% help to cut costs on fastening operations.

For detailed information about the complete I-R line of cost-cutting Air Tools—call or write your nearby I-R office.

8-880

Tools plus AIRengineering increase output per man

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Ambridge, Pa. N2	+12.25	....	+5.75	....	+3.25	....	+1.75	....	+1.75	....	+2	....	0.5	....
Lorain, O. N3	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Youngstown Y1	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

ELECTRICWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Alton, Ill. L1	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Benwood, W. Va. W10	1.5	+25	+10.5	+34	+21	+42.5	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Butler, Pa. F6	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Fairless, Pa. N3	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Fontana, Calif. K1	....	....	....	....	....	....	+10.75	+26	+7.75	+22	+4.25	+17.5	+1.75	+16.75
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	1.25	+14	4.25	+10	7.75	+5.5	10.25	+6.25
Lorain, O. N3	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sharon, Pa. S4	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sparrows Pt., Md. B2	0.5	+26	+11.5	+35	+22	+43.5	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Wheatland, Pa. W9	4.5	+22	+8.5	+32	+19.5	+41	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Youngstown R2, Y1	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.72		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	....	....	....	....
Alton, Ill. L1	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Benwood, W. Va. W10	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Etna, Pa. N2	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Fairless, Pa. N3	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Fontana, Calif. K1	+1.25	+15.75	+0.75	+15.25	0.75	+15.5	0.75	+15.5	+9.75	+26.5	+9.75	+26.5
Indiana Harbor, Ind. Y1	10.75	+3.75	11.25	+3.25	12.75	+3.5	12.25	+3.5	2.25	+14.5	2.25	+14.5
Lorain, O. N3	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	....	....	....	....
Sharon, Pa. M6	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	....	....	....	....
Sparrows Pt., Md. B2	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Wheatland, Pa. W9	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Youngstown R2, Y1	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5

*Galvanized pipe discounts based on current price of zinc (11.00c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Rerolling—Ingot	Rerolling—Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.00	27.00	....	36.00	40.00	42.00	39.25	48.50	45.00
202	23.75	30.25	36.50	39.00	40.75	43.00	40.00	49.25	49.25
301	23.25	28.00	37.25	37.25	42.00	44.25	41.25	51.25	47.50
302	25.25	31.50	38.00	40.50	42.75	45.00	42.25	52.00	52.00
302B	25.50	32.75	40.75	45.75	45.00	47.25	44.50	57.00	57.00
303	....	32.00	41.00	46.00	45.50	48.00	45.00	56.75	56.75
304	27.00	33.25	40.50	44.25	45.25	47.75	45.75	55.00	55.00
304L	....	....	48.25	51.50	53.00	55.50	53.50	63.25	63.25
305	28.50	36.75	42.50	47.50	45.25	47.75	46.25	58.75	58.75
308	30.75	38.25	47.25	50.25	52.75	55.75	55.25	63.00	63.00
309	39.75	49.50	57.75	64.50	62.75	67.00	66.00	80.50	80.50
310	49.75	61.50	78.00	84.25	86.50	91.00	87.75	96.75	96.75
314	....	....	77.50	....	86.50	91.00	87.75	99.00	104.25
316	39.75	49.50	62.25	69.25	69.25	73.00	71.75	80.75	80.75
316L	....	55.50	70.00	76.50	77.00	80.75	79.50	89.25	89.25
317	48.00	60.00	76.75	88.25	86.25	90.75	88.50	101.00	101.00
321	32.25	40.00	47.00	53.50	52.50	55.50	54.75	65.50	65.50
330	....	....	118.75	....	132.00	138.50	135.50	149.25	149.25
18-8 CbTa	37.00	46.50	55.75	63.50	61.50	64.75	64.75	79.25	79.25
403	....	....	28.25	....	32.00	33.75	30.00	40.25	40.25
405	19.50	25.50	29.75	36.00	33.50	35.25	32.50	46.75	46.75
410	16.75	21.50	28.25	31.00	32.00	33.75	30.00	40.25	40.25
416	....	....	28.75	....	32.50	34.25	31.25	48.25	48.25
420	26.00	33.50	34.25	41.75	39.25	41.25	40.25	62.00	62.00
430	17.00	21.75	28.75	32.00	32.50	34.25	31.00	40.75	40.75
430F	....	....	29.50	....	33.00	34.75	31.75	51.75	51.75
431	....	28.75	37.75	....	42.00	44.25	41.00	56.00	56.00
446	....	....	39.25	59.00	44.25	46.50	42.75	70.00	70.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co., Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steel Inc.; U. S. Steel Corp.; Universal Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel Co., subsidiary of Allegheny Ludlum Steel Corp.; Washington Steel Corp.

Clad Steel

	Plates—Carbon Base 5%	10%	15%	20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	26.05	28.80	31.55	34.30	39.75
304L	30.50	33.75	36.95	40.15	....
316	38.20	42.20	46.25	50.25	58.25
316L	42.30	46.75	51.20	55.65	....
316 Cb	49.90	55.15	60.40	65.65	....
321	31.20	34.50	37.75	41.05	47.25
347	36.90	40.80	44.65	48.55	57.00
405	22.25	24.60	26.90	29.25	....
410	20.55	22.70	24.85	27.00	....
430	21.20	23.45	25.65	27.90	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	62.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....

	Strip, Carbon Base—Cold Rolled—10%	Both Sides
Copper*	34.75	40.65

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Reg. Carbon (W-1)	0.330	W-Cr Hot Work (H-12)	0.530
Spec. Carbon (W-1)	0.385	V-Cr Hot Work (H-13)	0.550
Oil Hardening (O-1)	0.505	W Hot Wk. (H-21)	1.425-1.44
V-Cr Hot Work (H-11)	0.505	Hi-Carbon-Cr (D-11)	0.955

Grade by Analysis (%) W	Cr	V	Co	Mo	AISI Designation	$ per lb
18	¾	1	....	....	T-1	1.840
18	4	2	....	....	T-2	2.005
13.5	4	3	....	....	T-3	2.105
18.25	4.25	1	4.75	....	T-4	2.545
18	4	2	9	....	T-5	2.915
20.25	4.25	1.6	12.25	....	T-6	4.330
13.75	3.75	2	5	....	T-8	2.485
1.5	4	1	....	8.5	M-1	1.200
6.4	4.5	1.9	....	5	M-2	1.345
6	4	3	....	6	M-3	1.590

Tool steel producers include: A4, A8, B2, B8, C4, C9, C12, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
Birmingham R2	62.00	62.50**	....	....
Birmingham U6	....	62.50**	66.50	....
Woodward,Ala. W15	62.50*	62.50**	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	66.50	66.50	67.00
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon,Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,Ohio., deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	68.00	68.50	69.00	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
New York, deld.	....	75.50	76.00	....
Newark,N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland,Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa., deld.	....	67.60	67.60	68.13
Lawrenceville,Homestead, Wilmerding,Monaca,Pa., deld.	....	68.26	68.26	68.79
Verona,Trafford,Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard,Ohio Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	....
Mansfield,Ohio. deld.	71.30	....	71.80	72.30

	Basic	No. 2 Foundry	Malleable	Bessemer
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett,Mass. E1	67.50	68.00	68.50	....
Fontana,Calif. K1	75.00	75.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
GraniteCity,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

*Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.
‡Phos. 0.50% up; Phos. 0.30-0.49, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% and $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry, $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry, 12½ lb piglets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$73.00
Rockwood,Tenn. T3 (Phos. 0.055% max)	73.00
Troy,N.Y. R2 (Phos. 0.035% max)	73.00
Philadelphia, deld.	81.67
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Steel Service Center Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Atlanta	8.59§	9.86§	10.13	....	8.91	9.39	13.24#	....	9.40	9.29	11.21
Baltimore	8.55	9.25	9.99	....	9.05	9.45	11.85#	15.48	9.55	9.00	10.50
Birmingham	8.18	9.45	10.46	....	8.51	8.99	....	....	8.64	8.89	10.99
Boston	9.31	10.40	11.39	53.50	9.73	10.11	13.39#	15.71	10.01	10.02	11.85
Buffalo	8.40	9.60	11.30	55.98	8.75	9.15	11.45#	15.40	9.25	9.20	10.75
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.25	9.45	10.50	53.00	8.51	8.99	9.15	15.05	9.00	8.89	10.20
Cincinnati	8.43	9.51	10.55	53.43	8.83	9.31	11.53#	15.37	9.56	9.27	10.53
Cleveland	8.36	9.54	10.20	52.33	8.63	9.10	11.25#	15.16	9.39	9.13	10.44
Dallas	8.80	9.30	....	....	8.85	8.80	....	....	8.75	9.15	10.40
Denver	9.40	11.84	12.94	....	9.43	9.80	11.19	....	9.84	9.76	11.08
Detroit	8.51	9.71	10.87	56.50	8.88	9.30	9.51	15.33	9.56	9.26	10.46
Erie, Pa.	8.20	9.45	9.95[10]	....	8.60	9.10	11.25	....	9.35	9.10	10.60
Houston	8.40	8.90	10.29	52.00	8.45	8.40	11.60	15.75	8.35	8.75	10.10
Jackson, Miss.	8.52	9.79	....	....	8.57	8.94	10.68	....	8.97	8.90	10.74
Los Angeles	8.70[2]	10.80[2]	12.15[3]	57.60	9.15	9.10[2]	12.95[2]	16.35	9.00[2]	9.10[2]	11.30[2]
Memphis, Tenn.	8.55	9.80	10.45	....	8.58	9.32	11.96#	....	9.33	9.22	10.86
Milwaukee	8.39	9.59	10.64	....	8.65	9.13	9.39	15.19	9.22	9.03	10.34
Moline, Ill.	8.55	9.80	....	....	8.84	8.95	9.15	....	8.99	8.91	....
New York	8.87	10.13	10.56	53.08	9.64	9.99	13.25#	15.50	9.74	9.77	11.05
Norfolk, Va.	8.40	....	....	....	9.10	9.10	12.00	....	9.40	8.85	10.35
Philadelphia	8.20	9.25	11.34	52.71	9.25	9.40	11.95#	15.48	9.10	9.15	10.40**
Pittsburgh	8.35	9.55	10.85	52.00	8.61	8.99	11.25#	15.05	9.00	8.89	10.20
Richmond, Va.	8.40	....	10.40	....	9.10	9.00	....	....	9.40	8.85	10.35
St. Louis	8.63	9.83	10.88	....	8.89	9.37	9.78	15.43	9.48	9.27	10.58
St. Paul	8.79	10.04	11.09	....	8.84	9.21	9.86	....	9.38	9.30	10.49
San Francisco	9.65	11.10	11.00	55.10	9.75	10.15	13.00	16.00	9.85	10.00	12.35
Seattle	9.95	11.52[3]	10.95[3]	55.02	10.00	10.10	14.70	16.80[3]	9.80	9.70	12.10
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	9.95	11.55	12.20	57.38	10.00	10.10	14.70	16.80	9.80	9.70	12.10
Washington	9.15	....	....	....	9.65	10.05	12.50	....	10.15	9.60	11.10

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **⅛ in. and heavier; ††as annealed; ‡‡¾ in. to 4 in. wide, inclusive; #net price, 1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-finished bars, 2000 lb and over except in Seattle, 2000 to 3999 lb; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Seattle, 30,000 lb and over; [2]—30,000 lb; [3]—1000 to 4999 lb; [5]—1000 to 1999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchens, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., $140; Salina, Pa., $145; Niles, Ohio, $138; Cutler, Utah, $165.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $185; Stevens Pottery, Ga., $195; Cutler, Utah, $233.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., $158; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $163; E. Chicago, Ind., Joliet, Rockdale, Ill. $168; Lehigh, Utah, $175; Los Angeles, $180.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $157; Morrisville, Hays, Latrobe, Pa., $168; E. Chicago, Ind., $167; Curtner, Calif., $182.

Semisilica Brick (per 1000)

Clearfield, Pa., $140; Philadelphia, $137; Woodbridge, N. J., $135.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $335; Danville, Ill., $253; Philadelphia, Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $260.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $295; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., $320; Philadelphia, $310.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $335; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., $360; Philadelphia, $350.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $188.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.60.

Magnesite (per net ton)

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜ in. grains with fines: Baltimore, $73.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net ton, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $30-$33, contract; Mexican, all rail, duty paid, $25; barge, Brownsville, Tex., $27.

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, Swedish: deld. east of Mississippi River, ocean bags 23,000 lb and over..	10.50
F.o.b. Riverton or Camden, N. J., west of Mississippi River.	9.50
Sponge Iron, Domestic, 99 + % Fe: Deld. east of Mississippi River, 23,000 lb and over	10.50
Electrolytic Iron, Melting stock, 99.87% Fe, irregular fragments of ⅛ in. x 1.3 in.	28.75
(In contract lots of 240 tons price is 22.75c)	
Annealed, 99.5% Fe..	36.50
Unannealed (99 + % Fe)	36.00
Unannealed (99 + % Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh)..	29.00
Carbonyl Iron: 98.1-99.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh	
Aluminum: Atomized, 500-lb drum, freight allowed Carlots	38.50
Ton lots	40.50
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	32.80-48.80†
Bronze, 5000-lb lots	49.60-53.70†
Copper: Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese: Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	74.00
Nickel-Silver, 5000-lb lots	50.80-55.30†
Phosphor-Copper, 5000-lb lots	61.80
Copper (atomized) 5000-lb lots	42.30-50.80†
Silicon	47.50
Solder	7.00*
Stainless Steel, 304	$1.07
Stainless Steel, 316	$1.26
Tin	14.00*
Zinc, 5000-lb lots	18.50-31.70‡

Tungsten:	Dollars
Melting grade, 99% 60 to 200 mesh, nominal:	
1000 lb and over	3.15
Less than 1000 lb..	3.30
Chromium, electrolytic 99.8% Cr min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Inches Diam	Inches Length	Per 100 lb
2	24	$80.75
2½	30	39.25
3	40	37.00
4	40	35.00
5⅛	40	34.75
6	60	31.50
7	60	28.25
8, 9, 10	60	28.00
12	72	26.75
14	60	26.75
16	72	25.75
17	60	26.25
18	72	26.25
20	72	25.25
24	84	26.00

CARBON

8	60	13.30
10	60	13.00
12	60	12.95
14	60	12.85
14	72	11.95
17	60	11.85
17	72	11.40
20	84	11.40
20	90	11.00
24	72, 84	11.25
24	96	10.95
30	84	11.05
40, 35	110	10.70
40	100	10.70

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries.)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$5.05	$5.05	$4.95	$5.40
Bar Size Angles	5.05	5.05	5.00	5.38
Structural Angles	5.05	5.05	5.05	5.38
I-Beams	5.11	5.11	5.11	5.45
Channels	5.11	5.11	5.11	5.45
Plates (basic bessemer)	6.62	6.62	6.62	6.94
Sheets, H.R.	8.20	8.20	8.20	8.50
Sheets, C.R. (drawing quality)	8.75	8.75	8.75	9.12
Furring Channels, C.R., 1000 ft, ⅞ x 0.30 lb per ft	25.71	25.59	25.59	26.46
Barbed Wire (†)	6.65	6.65	6.65	7.00
Merchant Bars	5.40	5.40	5.35	5.90
Hot-Rolled Bands	7.15	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	5.05	5.18	5.00	5.35
Wire Rods, O.H. Cold Heading Quality No. 5..	5.80	5.93	5.75	6.05
Bright Common Wire Nails (§)	8.02	8.02	7.92	8.20

†Per 82 lb net reel. §Per 100-lb kegs, 20d nails and heavier.

Ores

Lake Superior Iron Ore

(Prices effective for the 1958 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30, 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, foundry and basic 62-64% concentrates	18.00-19.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	23.00
N. African hematite (spot)	nom
Brazilian iron ore, 68.5%	26.00

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$8.25-8.75*
Domestic, concentrates f.o.b. milling points	16.00-17.00†

*Before duty. †Nominal.

Manganese Ore

Mn 46-48%, Indian (export tax included) $1.10 per long ton unit, c.i.f. U. S. ports, duty for buyer's account: other than Indian, nominal; contracts by negotiation.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian	
48% 3:1	$42.00-44.00
48% 2.8:1	38.00-40.00
48% no ratio	29.00-31.00
South African Transvaal	
44% no ratio	22.00-23.00
48% no ratio	29.00-31.00
Turkish	
48% 3:1	51.00-55.00
Domestic	
Rail nearest seller	
18% 3:1	39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard	
50-55%	$2.25-2.40
60-65%	2.50-3.10

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.75
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$28.85
Cincinnati, deld.	31.84
Buffalo, ovens	30.50
Camden, N. J., ovens	29.50
Detroit, ovens	30.50
Pontiac, Mich., deld.	32.45
Saginaw, Mich., deld.	34.93
Erie, Pa., ovens	30.50
Everett, Mass., ovens:	
New England, deld.	31.55*
Indianapolis, ovens	29.75
Ironton, Ohio, ovens	29.00
Cincinnati, deld.	31.84
Kearny, N. J., ovens	29.75
Milwaukee, ovens	30.50
Neville Island (Pittsburgh), Pa., ovens.	29.25
Painesville, Ohio, ovens	30.50
Cleveland, deld.	32.69
Philadelphia, ovens	29.50
St. Louis, ovens	31.50
St. Paul, ovens	29.75
Chicago, deld.	33.18
Swedeland, Pa., ovens	29.50
Terre Haute, Ind., ovens	29.75

*Ore within $5.15 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	31.00‡
Toluene, one deg (deld.)	25.00*
Industrial xylene	29.00§

Per ton, bulk, ovens

Ammonium sulfate	$32.00-35.00†

Cents per pound, producing point

Phenol: Grade 1, 17.50; Grade 2-3, 15.50; Grade 4, 17.50; Grade 5, 16.50; Grade 6, 14.50.	

Effective: *Apr. 12; †July 1; ‡July 8; §Aug. 12.

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Neville Island, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx) base price per net ton, $245, Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively. (Mn 79-81%). Lump $253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-95%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.5% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn, packed, carload 26.8c, ton lot 28.4c, less ton 29.6c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2%). Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lot 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, bulk, 33.25c; 2000 lb to min carload, 36c; less ton, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi River; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Carload, lump, bulk 1.50% C grade, 18-20% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton to 300 lb, $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton to 300 lb $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract min c.l. $240 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis. Spot, $245.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4%). Contract, c.l. $290 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed. Spot, $295.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk 28.75c per lb of contained Cr; c.l. packed 30.30c, ton lot 32.05c; less ton 33.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Ton lot, add 3.5c; less ton, add 5.2c. Delivered.

Cr 67-71%, carload, lump, bulk, C 0.02% max, 41.00c per lb contained Cr; 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max, 37.75c; 1.5% max, 37.50c; 2.0% max, 37.25c. Ton lot, add 3.4c; less ton lot, add 5.1c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 61-66%, C 5-7%, Si 7-10%). Contract, c.l., 2 in. x D, bulk 30.8c per lb of contained Cr. Packed, c.l. 32.4c, ton 34.2c, less ton 35.7c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload packed, SM x D, 21.25c per lb of alloy, ton lot 22.50c; less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk, 3" x down and 2" x down, 28.25c per lb contained Cr, 14.60c per lb contained Si. 0.75" x down 29.40c per lb contained Cr, 14.60c per lb contained Si.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed 2" x D plate (about ¼" thick) $1.15 per lb, ton lot $1.17, less ton lot $1.19. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55% or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Contract, carload, lump, bulk, 14.6c per lb of contained Si. Packed c.l. 17.1c, ton lot 18.55c, less ton 20.20c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.75c per lb contained silicon. Packed, c.l. 17.75c, ton lot 19.55c, less ton 20.9c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.9c per lb of contained Si. Packed c.l. 18.8c, ton lot 20.45c, less ton 21.7c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 20c per lb of contained Si. Packed, c.l. 21.65c, ton lot 23.05c, less ton 24.1c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 1.00% max Fe, 0.07% max Ca). C.l. lump, bulk, 21.5c per lb of Si. Packed, c.l. 23.15c, ton lot 24.45c, less ton 25.45c. Add 0.5c for max 0.03% Ca grade. Add 0.5c for 0.50% Fe grade analyzing min 98.25% min Si.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.85c per lb of alloy; ton lot, packed, 10.85c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk, 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c

BORON ALLOYS

Ferroboron: 100 lb or more packed, (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices. 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20 Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Carbortam: (B 1 to 2%). Contract, lump, carload $320 per ton, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3⅜ lb each and containing 2 lb of Cr). Contract, carload, bulk 19.60c per lb of briquet, in bags 20.70c; 3000 lb to c.l. pallets 20.80c; 2000 lb to c.l. in bags 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Contract, carload, bulk 14.8c per lb of briquet; c.l., packed, bags 16c; 3000 lb to c.l., pallets 16c; 2000 lb to c.l., bags 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). Contract, c.l. bulk 15.1c per lb of briquet; c.l. packed, bags 16.3c, 3000 lb to c.l., pallets 16.3c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si and small sizes, weighing approx 2½ lb and containing 1 lb of Si). Contract, carload, bulk 8c per lb of briquet; packed, bags 9.2c; 3000 lb to c.l., pallets 9.6c; 2000 lb to c.l., bags 10.8c; less ton 11.7c. Delivered. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.49 per lb of Mo contained, f.o.b. Langeloth, Pa.

Titanium Briquets: Ti 98.27%, $1 per lb, f.o.b. Niagara Falls, N. Y.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.15 per lb (nominal) of contained W. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Ton lots 2" x D, $4 per lb of contained Cb; less ton lots $4.05 (nominal). Delivered.

Ferrotantalum Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lots 2" x D, $3.80 per lb of contained Cb plus Ta, delivered; less ton lots $3.85 (nominal).

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, c.l. packed ½-in. x 12 M 20.00c per lb of alloy, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 20c per lb of alloy, ton lot 21.15c; less ton lot 22.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.45c per lb of alloy; ton lot 19.95c; less ton lot 21.20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 19.25c. Packed c.l. 20.25c, 2000 lb to c.l. 21.25c; less than 2000 lb 21.75c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $5 for each 1% of P above or below the base). Carload, bulk, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $120 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo, in 200-lb container, f.o.b. Langeloth and Washington, Pa. $1.76 in all sizes except powdered which is $1.82.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans, $1.47; in bags, $1.46, f.o.b. Langeloth and Washington, Pa.

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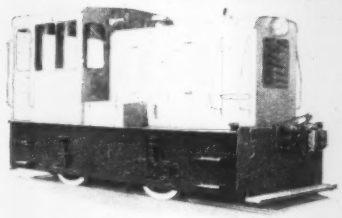

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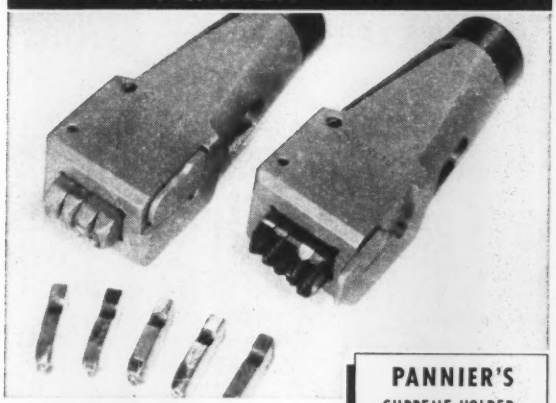

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WHEELING STEEL

Scrap Price Index Marking Time

STEEL's composite on the prime grades holds unchanged at $42.33. Mill buying of dealer scrap restricted, but rising steel rate encourages hopes for early pickup

Scrap Prices, Page 176

Pittsburgh — Although steelmaking operations remain at the highest level of the year (69.5 per cent of capacity), the major mills aren't buying scrap. Prices are unchanged in the absence of a representative market test.

Chicago—With a few exceptions, scrap prices are unchanged. Buying is limited. Steelmaking has climbed to 88 per cent of capacity here, the highest rate since the week ended June 9, 1957, when operations hit 89.5 per cent.

Operations are about 12 points above the national average, yet they fail to inject bullishness into the scrap market. The reason: Increased steel production is supported by hot metal rather than scrap.

Philadelphia—Quotations on the major grades of open hearth scrap are unchanged, but the tone of the market is easier, with lower prices quoted on several minor steel grades and heavy breakable cast. Softness in the market is ascribed to dull domestic demand and dim prospects for foreign business the rest of this year.

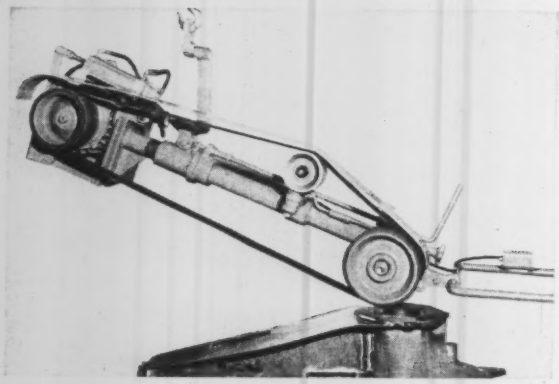
Electric furnace bundles are lower at $41, delivered. Short shoveling turnings are nominally easier at $23-$24, and machine shop turnings are at $19-$20. Low phos structurals and plates are down $1 to $43-$44; couplers, springs, and wheels are off sharply to $44; rail crops (2 ft and under) are down a little to $57-$58. Heavy breakable cast is easier at $42-$43; malleable is unchanged at $58, but nominal.

New York—Brokers have reduced their buying prices on No. 1 heavy melting and No. 1 bundles to $29-$30, a drop of $2 a ton. No. 2 heavy melting is off $1, being quoted at $26-$27.

Cleveland — Except for a small mill purchase of low phos material at $46, the market here and in the Valley was lifeless last week so far as dealer material was concerned. Most of the tonnage moving to area steel mills is of factory origin, and with production scrap generation increasing, the dealer market tends toward the easy side. Prices are unchanged on the steel and foundry grades, but they're mostly nominal. Stainless scrap is a little stronger, with brokers' buying prices up about $5 a ton.

Detroit—The market is quiet, following a series of orders for No. 1 items. Small tonnages of machine shop and short shoveling turnings have been shipped to docks to fill out final water shipments before the navigation season closes.

Dealers and brokers say the market is dull. They expect December to be a critical month. Mills are expected to place heavier orders de-



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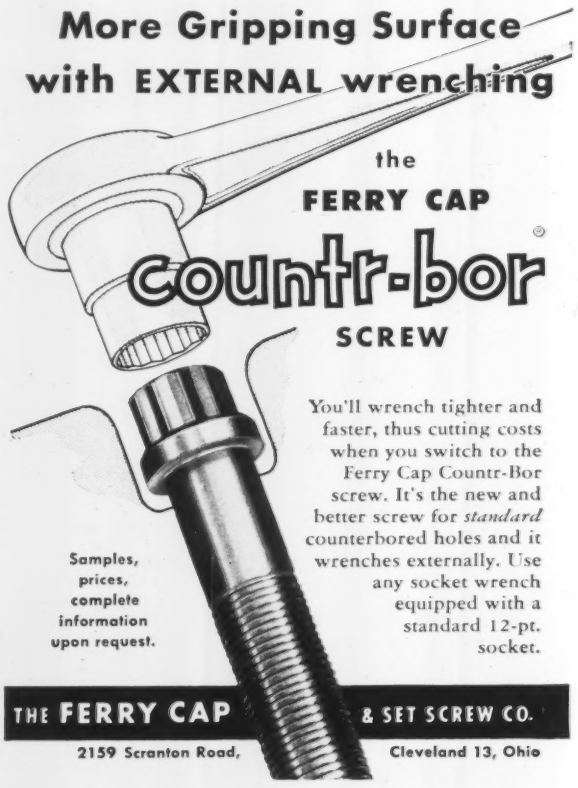

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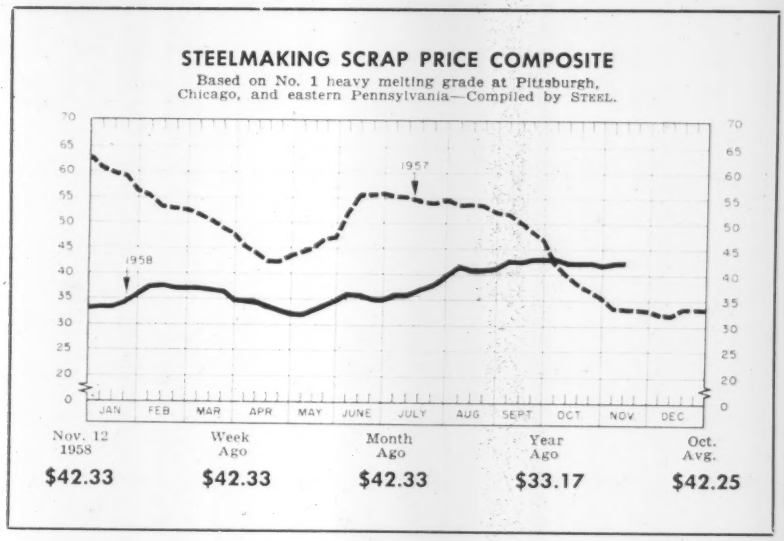
STEELMAKING SCRAP PRICE COMPOSITE
Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania—Compiled by STEEL.
1957
1958
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
Nov. 12 1958 $42.33
Week Ago $42.33
Month Ago $42.33
Year Ago $33.17
Oct. Avg. $42.25

spite high inventories in yards.

Buffalo — Lack of buying has weakened the price of railroad scrap. Random lengths are quoted $48-$49, and rail crops $54-$55; both are down about $3 a ton.

Low phos scrap is stronger because of improved demand from specialty interests. Other grades are unchanged.

Over-all market activity remains low. While the mills have extended their October buying prices into November, they're not reaching out actively for scrap.

Cincinnati—The market is firm. Prices are unchanged. Brokers are experiencing difficulty in filling first-of-the-month mill orders. Dealers are attempting to accumulate tonnage, anticipating a price increase as steel production rises.

St. Louis — An undertone of strength is noted in the market, but not much scrap is coming into dealers' yards. Demand is not strong enough to push prices up. The mills hold relatively good-sized inventories.

Birmingham—Sales are limited, but the market is not noticeably weak. Brokers say most consumers bought heavily in October. A local electric furnace plant placed its November requirements at unchanged prices. With pressure from pipemakers off seasonally, brokers expect some easing in prices, possibly $1 to $2. The export market continues quiet.

Houston — The scrap market is quiet, with prices unchanged. The leading mill consumer here is out of the market for the rest of the year. Mexican mills have not returned to the market, but they are expected to resume buying soon. Gulf Coast export trade is dormant.

Los Angeles—Prices are up $2 to $7 a ton here. No. 1 heavy melting, No. 2 heavy melting, and No. 1 bundles advanced $2. No. 1 railroad heavy melting went up $6, and cupola cast $7. The rise is attributed to better buying, especially of No. 1 railroad, now quoted at $38, and cupola cast, quoted at $46.

Seattle—Dealers think a market upturn is coming soon and are holding their stocks for higher prices. Consequently, little scrap is moving at current levels. Receipts are also light. Larger buyers are inactive. There's no activity in the export market.

San Francisco — Prices are unchanged, with brokers and dealers awaiting new market developments. The forecast: Sluggish demand through the remainder of this year.

Hamilton, Ont.—Prices are unchanged here for the fourth straight month. The market is listless, largely due to the just-terminated strike at the plant of the Steel Co. of Canada Ltd. which was down since mid-August. Dominion Foundries & Steel Ltd. is taking in scrap on a selective basis but has not changed its buying prices.

Canada . . .

Steel production in Canada is expected to jump about 30 per cent now that Steel Co. of Canada Ltd. is back in operation after settlement of a prolonged strike.

For the week ended Oct. 25, Canadian ingot production was 56,056 net tons, or 49.3 per cent of capacity, vs. 56,784 tons (49.9 per cent) the week preceding.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 166

August and September orders for fasteners were at a better rate than had been expected, says George S. Case Jr., president, Lamson & Sessions Co., Cleveland.

"When the automobile companies get into volume production, our orders should show a further increase." He predicts that the fourth quarter could be as good, or better, than the same period last year.

The fastener executive said that the pickup in orders resulted in a slight firming up of prices recently, and he looks for another price increase around the start of next year.

Pig Iron . . .

Pig Iron Prices, Page 170

Pig iron sellers see little pickup in foundry activity during the remainder of this year. Jobbing foundries have small backlogs of orders for castings and are ordering supplies to meet only immediate needs.

Merchant ironmakers have sizable inventories and are producing below capacity levels. Republic Steel Corp. has banked a blast furnace at its Youngstown Works and one at its Cleveland Works.

Domestic producers, especially those serving the eastern seaboard, are finding their situation complicated by sharp competition from West Germany and Holland. A cargo of 10,500 tons of European pig iron is being unloaded at Philadelphia. The shipment includes 1200 tons of Dutch iron (all of which has been sold) and 9300 tons of West German iron (at least 7000 tons will be placed in ground storage at Port Richmond).

(*Please turn to Page* 181)

Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, Nov. 12, 1958. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Nov. 12	$42.33
Nov. 5	42.33
Oct. Avg.	42.25
Nov. 1957	33.17
Nov. 1953	35.00

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	44.00-45.00
No. 2 heavy melting	35.00-36.00
No. 1 dealer bundles	44.00-45.00
No. 2 bundles	31.00-32.00
No. 1 busheling	44.00-45.00
No. 1 factory bundles	49.00-50.00
Machine shop turnings	23.00-24.00
Mixed borings, turnings	23.00-24.00
Short shovel turnings	27.00-28.00
Cast iron borings	27.00-28.00
Cut structurals:	
2 ft and under	49.00-50.00
3 ft lengths	48.00-49.00
Heavy turnings	34.00-35.00
Punchings & plate scrap	49.00-50.00
Electric furnace bundles	49.00-50.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Stove plate	41.00-42.00
Unstripped motor blocks	31.00-32.00
Clean auto cast	39.00-40.00
Drop broken machinery	52.00-53.00

Railroad Scrap

No. 1 R.R. heavy melt	47.00-48.00
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	58.00-59.00
Random rails	54.00-55.00
Railroad specialties	52.00-53.00
Angles, splice bars	52.00-53.00
Rails, rerolling	60.00-61.00

Stainless Steel Scrap

18-8 bundles & solids	225.00-230.00
18-8 turnings	125.00-130.00
430 bundles & solids	125.00-130.00
430 turnings	55.00-65.00

CHICAGO

No. 1 hvy melt, indus.	43.00-45.00
No. 1 heavy melt, dealer	40.00-41.00
No. 2 heavy melting	34.00-35.00
No. 1 factory bundles	*47.00-48.00*
No. 1 dealer bundles	42.00-43.00
No. 2 bundles	28.00-29.00
No. 1 busheling, indus.	43.00-45.00
No. 1 busheling, dealer	40.00-41.00
Machine shop turnings	*22.00-23.00*
Mixed borings, turnings	*24.00-25.00*
Short shovel turnings	*24.00-25.00*
Cast iron borings	*24.00-25.00*
Cut structurals, 3 ft	46.00-47.00
Punchings & plate scrap	47.00-48.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Stove plate	43.00-44.00
Unstripped motor blocks	37.00-38.00
Clean auto cast	51.00-52.00
Drop broken machinery	51.00-52.00

Railroad Scrap

No. 1 R.R. heavy melt.	45.00-46.00
R. R. malleable	55.00-56.00
Rails, 2 ft and under	58.00-59.00
Rails, 18 in. and under	59.00-60.00
Angles, splice bars	54.00-55.00
Axles	67.00-68.00
Rails, rerolling	62.00

Stainless Steel Scrap

18-8 bundles & solids	215.00-220.00
18-8 turnings	*115.00-120.00*
430 bundles & solids	115.00-120.00
430 turnings	55.00-60.00

YOUNGSTOWN

No. 1 heavy melting	43.00-44.00
No. 2 heavy melting	30.00-31.00
No. 1 busheling	43.00-44.00
No. 1 bundles	43.00-44.00
No. 2 bundles	30.00-31.00
Machine shop turnings	15.00-16.00
Short shovel turnings	20.00-21.00
Cast iron borings	20.00-21.00
Low phos.	46.00-47.00
Electric furnace bundles	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt.	46.00-47.00

CLEVELAND

No. 1 heavy melting	39.50-40.50
No. 2 heavy melting	26.00-27.00
No. 1 factory bundles	46.00-47.00
No. 1 bundles	39.50-40.50
No. 2 bundles	30.50-31.50
No. 1 busheling	39.50-40.50
Machine shop turnings	14.00-15.00
Short shovel turnings	20.00-21.00
Mixed borings, turnings	20.00-21.00
Cast iron borings	20.00-21.00
Cut foundry steel	*41.00-42.00*
Cut structurals, plates 2 ft and under	48.00-49.00
Low phos. punchings & plate	41.00-42.00
Alloy free, short shovel turnings	22.00-23.00
Electric furnace bundles	42.50-43.50

Cast Iron Grades

No. 1 cupola	44.00-45.00
Charging box cast	37.00-38.00
Heavy breakable cast	36.00-37.00
Stove plate	43.00-44.00
Unstripped motor blocks	32.00-33.00
Brake shoes	36.00-37.00
Clean auto cast	49.00-50.00
Burnt cast	33.00-34.00
Drop broken machinery	49.00-50.00

Railroad Scrap

R.R. malleable	63.00-64.00
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	58.00-59.00
Rails, random lengths	52.00-53.00
Cast steel	49.00-50.00
Railroad specialties	50.00-51.00
Uncut tires	43.00-44.00
Angles, splice bars	50.00-51.00
Rails, rerolling	56.00-57.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	*205.00-215.00*
18-8 turnings	*115.00-120.00*
430 clips, bundles, solids	*110.00-120.00*
430 turnings	40.00-50.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	38.00
No. 2 heavy melting	36.00
No. 1 bundles	40.00
No. 2 bundles	29.00
No. 1 busheling	40.00
Machine shop turnings	20.00†
Short shovel turnings	22.00†

Cast Iron Grades

No. 1 cupola	49.00
Charging box cast	40.00
Heavy breakable cast	38.00
Unstripped motor blocks	39.00
Clean auto cast	49.00
Stove plate	46.00

Railroad Scrap

No. 1 R.R. heavy melt	45.50
Rails, 18 in. and under	52.00†
Rails, random lengths	48.00
Rails, rerolling	62.25
Angles, splice bars	48.00

BIRMINGHAM

No. 1 heavy melting	38.00-39.00
No. 2 heavy melting	30.00-31.00†
No. 1 bundles	38.00-39.00
No. 2 bundles	23.00-24.00
No. 1 busheling	38.00-39.00
Cast iron borings	13.00-14.00
Machine shop turnings	24.00-25.00
Short shovel turnings	25.00-26.00
Bars, crops and plates	*44.00-45.00*
Structurals & plates	*43.00-44.00*
Electric furnace bundles	40.00-41.00
Electric furnace:	
2 ft and under	38.00-39.00
3 ft and under	37.00-38.00

Cast Iron Grades

No. 1 cupola	54.00-55.00
Stove plate	53.00-54.00
Unstripped motor blocks	*42.00-43.00*
Charging box cast	29.00-30.00
No. 1 wheels	*43.00-44.00*

Railroad Scrap

No. 1 R.R. heavy melt.	39.00-40.00
Rails, 18 in. and under	52.00-53.00
Rails, rerolling	58.00-59.00
Rails, random lengths	47.00-48.00
Angles, splice bars	48.00-49.00

PHILADELPHIA

No. 1 heavy melting	40.00
No. 2 heavy melting	36.00
No. 1 bundles	40.00
No. 2 bundles	24.00
No. 1 busheling	40.00
Electric furnace bundles	*41.00*
Mixed borings, turnings	20.00-21.00†
Short shovel turnings	*23.00-24.00†*
Machine shop turnings	*19.00-20.00†*
Heavy turnings	34.00-35.00†
Structurals & plate	*43.00-44.00*
Couplers, springs, wheels	*44.00*
Rails crops, 2 ft & under	*57.00-58.00*

Cast Iron Grades

No. 1 cupola	41.00
Heavy breakable cast	43.00
Malleable	58.00
Drop broken machinery	49.00-50.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*29.00-30.00*
No. 2 heavy melting	*26.00-27.00*
No. 1 bundles	*29.00-30.00*
No. 2 bundles	19.00-20.00
Machine shop turnings	10.00-11.00
Mixed borings, turnings	11.00-12.00
Short shovel turnings	14.00-15.00
Low phos. (structurals & plates)	37.00-38.00

Cast Iron Grades

No. 1 cupola	36.00-37.00
Unstripped motor blocks	28.00-29.00
Heavy breakable	33.00-34.00

Stainless Steel

18-8 sheets, clips, solids	190.00-195.00
18-8 borings, turnings	90.00-95.00
410 sheets, clips, solids	65.00-70.00
430 sheets, clips, solids	85.00-90.00

BUFFALO

No. 1 heavy melting	35.00-36.00
No. 2 heavy melting	29.00-30.00
No. 1 bundles	35.00-36.00
No. 2 bundles	27.00-28.00
No. 1 busheling	35.00-36.00
Mixed borings, turnings	17.00-18.00
Machine shop turnings	15.00-16.00
Short shovel turnings	19.00-20.00
Cast iron borings	17.00-18.00
Low phos, structurals and plate, 2 ft and under	*43.00-44.00*

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	44.00-45.00
No. 1 machinery	48.00-49.00

Railroad Scrap

Rails, random lengths	*48.00-49.00*
Rails, 3 ft and under	*54.00-55.00*
Railroad specialties	43.00-44.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	38.50-39.50
No. 2 heavy melting	33.50-34.50
No. 1 bundles	38.50-39.50
No. 2 bundles	26.00-27.00
No. 1 busheling	38.50-39.50
Machine shop turnings	19.00-20.00
Mixed borings, turnings	17.00-20.00
Short shovel turnings	22.00-23.00
Cast iron borings	19.00-20.00
Low phos, 18 in.	46.00-47.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Heavy brakable cast	38.00-39.00
Charging box cast	36.00-37.00
Drop broken machinery	47.00-48.00

Railroad Scrap

No. 1 R.R. heavy melt.	44.00-45.00
Rails, 18 in. and under	55.00-56.00
Rails, random lengths	49.00-50.00

HOUSTON

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	40.00
No. 2 heavy melting	34.00
No. 1 bundles	40.00
No. 2 bundles	25.00
Machine shop turnings	17.00
Short shovel turnings	20.00
Low phos. plates & structurals	45.50

Cast Iron Grades

No. 1 cupola	47.00
Heavy breakable	30.00†
Foundry malleable	41.00
Unstripped motor blocks	37.00

Railroad Scrap

No. 1 R.R. heavy melt.	38.00†

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	29.00-30.00
No. 2 heavy melting	23.00-24.00
No. 1 bundles	29.00-30.00
No. 2 bundles	17.00-18.00†
No. 1 busheling	29.00-30.00
Machine shop turnings	9.00-10.00
Short shovel turnings	12.00-13.00
No. 1 cast	33.00-34.00
Mixed cupola cast	33.00-34.00
No. 1 machinery cast	36.00-38.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*35.00-36.00*
No. 2 heavy melting	*22.50-23.50*
No. 1 bundles	*36.00-37.00*
No. 2 bundles	*22.50-23.50*
No. 1 busheling	*35.00-36.00*
Machine shop turnings	*13.00-14.00*
Mixed borings, turnings	14.00-15.00
Short shovel turnings	15.00-16.00
Punchings & plate	*34.00-35.00*

Cast Iron Grades

No. 1 cupola	*46.00-47.00*
Stove plate	36.00-37.00
Charging box cast	37.00-38.00
Heavy breakable	*37.00-38.00*
Unstripped motor blocks	21.00-22.00
Clean auto cast	*48.00-49.00*

SEATTLE

No. 1 heavy melting	30.00†
No. 2 heavy melting	28.00†
No. 1 bundles	22.00†
No. 2 bundles	20.00†
Machine shop turnings	9.00-10.00†
Mixed borings, turnings	9.00-10.00†
Electric furnace No. 1	38.00†

Cast Iron Grades

No. 1 cupola	31.00†
Heavy breakable cast	28.00†
Unstripped motor blocks	23.00†
Stove plate (f.o.b. plant)	21.00†

LOS ANGELES

No. 1 heavy melting	*34.00*
No. 2 heavy melting	*32.00*
No. 1 bundles	*30.00*
No. 2 bundles	17.00
Machine shop turnings	11.00
Shoveling turnings	13.00
Cast iron borings	13.00
Cut structurals and plate 1 ft and under	45.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	*46.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*38.00*

SAN FRANCISCO

No. 1 heavy melting	32.00
No. 2 heavy melting	30.00
No. 1 bundles	30.00
No. 2 bundles	22.00
Machine shop turnings	15.00
Mixed borings, turnings	15.00
Cast iron borings	15.00
Heavy turnings	15.00
Short shovel turnings	15.00
Cut structurals, 3 ft	40.00

Cast Iron Grades

No. 1 cupola	44.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT.

No. 1 heavy melting	30.00
No. 2 heavy melting	26.00
No. 1 bundles	30.00
No. 2 bundles	23.00
Mixed steel scrap	25.00
Mixed borings, turnings	15.00
Busheling, new factory:	
Prepared	30.00
Unprepared	24.00
Short steel turnings	19.00

Cast Iron Grades‡

No. 1 machinery cast	*39.00-41.00*

*Brokers' buying price.
†Nominal.
‡F.o.b. Hamilton, Ont.

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AMERICAN CANCER SOCIETY

Zinc Market Booming

Spurt in diecasting sales and good demand from galvanizers pace the surge. Prices are up and may move higher. Earnings up in third quarter. Copper demand heavy

Nonferrous Metal Prices, Pages 180 & 181

THERE'S LITTLE GLOOM in the zinc industry. Sales are better than they have been all year, and prices are the highest they have been since May, 1957.

• **Who's Buying** — Galvanizing is still the kingpin. Demand from construction and farm users is so good that mills are hard pressed to make fast deliveries. One major steel company says its galvanizing operation will be at 100 per cent of capacity this month and next, that delivery promises have gone from three weeks to 11.

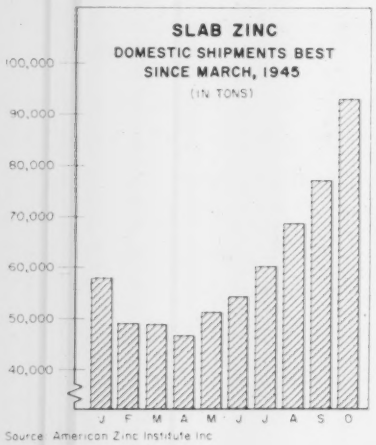
Diecasters have started to buy. Producers say sales of special high grade run "good" to "excellent." One firm says October sales to diecasters were the best in its history. Most orders have come from job shops. The fact that Detroit's captive shops are beginning to come to life should guarantee good sales at least through the first quarter.

The perkup in the brass mill industry has also helped. Producers say sales here are beginning to hit their best level of the year.

• **Prices Higher**—Producers took a look at the strengthening market on Nov. 7, liked what they saw, and boosted the quotation 0.5 cent to 11.5 cents a pound. They were also impressed by their shrinking inventories. Persistent rumors that some type of workable barter program is on the horizon may have entered into the decision.

There's a strong feeling that the market could stand another 0.5 cent a pound boost—certainly before yearend. Expect such a move if sales hold their pace.

• **Best Month**—True to expectations, October was a red letter month for the industry. Domestic slab zinc shipments hit a healthy 93,018 tons, the best performance in over 13 years, reports the American Zinc Institute Inc. (See chart.) Total shipments (including export and drawback) of 93,244 tons were the highest since



Source: American Zinc Institute Inc.

March, 1957. Producers' stocks dropped 28,000 tons (to 210,176 tons), marking the third straight month sales have beat production.

Profits Up Last Quarter

Earnings of most nonferrous companies showed improvement in the third quarter. But profits for the first nine months are well under the year ago figure. Producers are confident the fourth quarter will be still better but few expect the year to match 1957.

Here's the net income report of nine representative companies during the first three quarters: Aluminum Co. of America, $32,724,813, vs. $59,562,907 last year; Kaiser Aluminum & Chemical Corp., $18,738,000, vs. $22,531,000; Aluminium Ltd., $17,988,000, vs. $30,926,000.

Kennecott Copper Corp., $37,770,274, vs. $64,999,680; Phelps Dodge Corp., $21,728,332, vs. $36,798,747; Revere Copper & Brass Inc., $2,166,075, vs. $6,482,330.

International Nickel Co. of Canada Ltd., $30,321,000, vs. $66,017,000; American Smelting & Refining Co., $11,218,500, vs. $17,997,900; American Metal Climax Inc., $11,689,942, vs. $19,435,482 in 1957.

Copper Riding High

Business continues to be brisk for the copper industry. Demand is especially heavy from overseas markets which have felt the pinch of strikes in Africa and Canada.

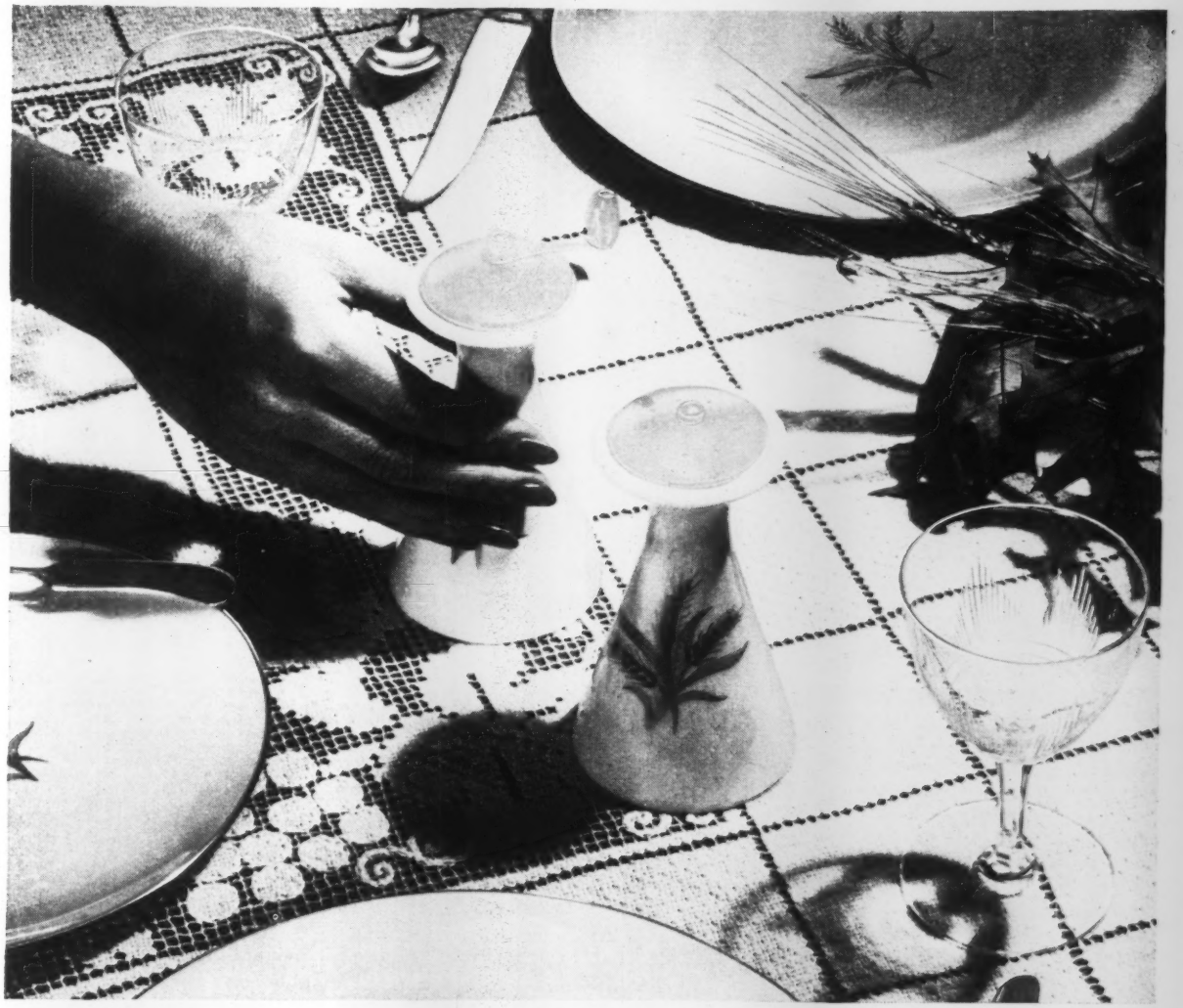
Even though African walkouts have ended, it will be another six to eight weeks before metal will flow from refineries. The tight supply situation is indicated by overseas prices. The London Metal Exchange has been fluctuating near 32 cents a pound; Katanga is at 31.30, c.i.f., New York.

Prices in the U. S. appear to be firm. Custom smelters are finding it more profitable to sell to overseas users—a practice which may signal an increase, especially if more scrap becomes available.

NONFERROUS PRICE RECORD

	Price Nov. 12	Last Change	Previous Price	Oct. Avg	Sept. Avg	Nov., 1957 Avg
Aluminum	24.70	Aug. 1, 1958	24.00	24.700	24.700	26.000
Copper	29.00–30.00	Oct. 24, 1958	27.50–30.00	28.058	26.428	26.217
Lead	12.80	Oct. 14, 1958	12.30	12.473	10.730	13.300
Magnesium	35.25	Aug. 13, 1958	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	99.375	Nov. 12, 1958	100.00	96.500	94.120	89.288
Zinc	11.50	Nov. 7, 1958	11.00	10.865	10.000	10.000

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig, 99.8%, Velasco, Tex.



"Top" Brass for Lenox China Cuts Polishing Costs 20%

Where kings and presidents dine . . . and in your own home . . . you'll probably find beautiful Lenox China. Among the more striking pieces in the Lenox line are unique salt shaker and pepper mill sets made of fine china, in patterns that match Lenox dinnerware. Topping off these lovely pieces are gold-plated caps stamped from Bridgeport High Luster Brass Strip.

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Sales Offices in Principal Cities

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 24.70; ingots, 26.80, 30,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 28.60; No. 43, 28.40; No. 195, 29.40; No. 214, 30.20; No. 356, 28.60; 30 or 40 lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 23.50-24.50, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.45 per lb deld.

Cobalt: 97.99%, $2.00 per lb for 550-lb keg; $2.02 per lb for 100 lb case; $2.07 per lb under 100 lb.

Columbium: Powder, $55-85 per lb, nom.

Copper: Electrolytic, 29.00 deld.; custom smelters, 30.00; lake, 29.00 deld.; fire refined, 28.75 deld.

Germanium: First reduction, $179.17-197.31 per lb; intrinsic grade, $197.31-220 per lb, depending on quantity.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $70-80 nom. per troy oz.

Lead: Common, 12.80; chemical, 12.90; corroding, 12.90, St. Louis. New York basis, add 0.20.

Lithium: 98 + %, 50-100 lb, cups or ingots, $12; rod, $15; shot or wire, $16. 100-500 lb, cups or ingots, $10.50; rod, $14; shot or wire, $15, f.o.b. Minneapolis.

Magnesium: Pig, 35-25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, 9Z91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $230-233 per 76-lb flask.

Molybdenum: Unalloyed, turned extrusions, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb or more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. points of entry, contained nickel, 69.60.

Osmium: $70-100 per troy oz nom.

Palladium: $15-17 per troy oz.

Platinum: $57-60 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $118-125 per troy oz.

Ruthenium: $45-55 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market, 90.125 per troy oz.

Sodium: 17.00 c.l.; 19.00-19.50 l.c.l.

Tantalum: Rod, $60 per lb; sheet, $55 per lb.

Tellurium: $1.65-1.85 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot, 99.375; prompt, 99.25.

Titanium: Sponge, 99.3 + % grade A-1, ductile (0.3% Fe max.), $1.62-1.82; grade A-2 (0.5% Fe max.), $1.70 per lb.

Tungsten: Powder, 89.8%, carbon reduced, 1000-lb lots, $3.15 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $3.30-3.80.

Zinc: Prime Western, 11.50; brass special, 11.75; intermediate, 12.00, East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 12.50; special high grade, 12.75 deld. Diecasting alloy ingot No. 3, 14.00; No. 2, 14.25; No. 5, 14.50 deld.

Zirconium: Reactor grade sponge, 100 lb or less, $7 per lb; 100-500 lb, $6.50 per lb; over 500 lb, $6 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 23.50-25.25; No. 12 foundry alloy (No. 2 grade), 21.50-22.00; 5% silicon alloy, 0.60 Cu max., 24.75-25.00; 13 alloy 0.60 Cu max., 24.75-25.00; 195 alloy, 25.25-26.00; 108 alloy, 22.25-22.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 22.75; grade 2, 21.50; grade 3, 20.50; grade 4, 18.00.

Brass Ingot: Red brass, No. 115, 29.00; tin bronze, No. 225, 38.00; No. 245, 32.75; high-leaded tin bronze, No. 305, 33.25; No. 1 yellow, No. 405, 24.00; manganese bronze, No. 421, 25.75.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.885, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.865, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 20,000-lb lots, 34.35; l.c.l., 34.98. Weatherproof, 20,000-lb lots, 35.54; l.c.l., 36.29.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $18.50 per cwt; pipe, full coils, $18.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheets and strip, $8.50-15.95; sheared mill plate, $6.00-9.50; wire, $6.50-10.50; forging billets, $3.80-4.35; hot-rolled and forged bars, $5.10-6.25.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 24.00; ribbon zinc in coils, 20.50; plates, 19.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R., strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strip, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100, 3003, and 5005 mill finish (30,000 lb base; freight allowed).

Thickness Range, Inches	Flat Sheet	Coiled Sheet
0.250-0.136	42.80-47.30	.....
0.136-0.096	43.20-48.30	.....
0.126-0.103	.....	39.20-39.80
0.096-0.077	43.80-50.00	39.30-40.00
0.077-0.068	44.30-52.20	.....
0.077-0.061	.....	39.50-40.70
0.068-0.061	44.30-52.20	.....
0.061-0.048	44.90-54.40	40.10-41.80
0.048-0.038	45.40-57.10	40.60-43.20
0.038-0.030	45.70-62.00	41.00-45.70
0.030-0.024	46.20-53.70	41.30-45.70
0.024-0.019	46.90-56.80	42.40-44.10
0.019-0.017	47.70-54.10	43.00-44.70
0.017-0.015	48.60-55.00	43.80-45.50
0.015-0.014	49.60	44.80-46.50
0.014-0.012	50.80	45.50
0.012-0.011	51.80	46.70
0.011-0.0095	53.50	48.10
0.0095-0.0085	54.60	49.60
0.0085-0.0075	56.20	50.80
0.0075-0.007	57.70	52.30
0.007-0.006	59.30	53.70

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in. 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.40	47.20
5050-F	43.50	48.30
3004-F	44.50	50.20
5052-F	45.10	50.90
6061-T6	45.60	51.70
2024-T4	49.30	56.10
7075-T6*	57.60	64.70

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats*	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
0.125	76.90	73.90	....	....
0.250	62.00	60.20	89.10	76.60
0.375	61.20	60.00	73.50	68.50
0.500	61.20	60.00	73.50	68.50
0.625	61.20	60.00	69.80	64.20
0.750	59.70	58.40	63.60	60.40
0.875	59.70	58.40	63.60	60.40
1.000	59.70	58.40	63.60	60.40
1.125	57.30	56.10	61.50	58.30
1.250	57.30	56.10	61.50	58.30
1.350	57.30	56.10	61.50	58.30
1.500	57.30	56.10	61.50	58.30
1.625	55.00	53.60	....	56.20
1.750	55.00	53.60	60.30	56.20
1.875	55.00	53.60	....	56.20
2.000	55.00	53.60	60.30	56.20
2.125	53.50	52.10	....	....
2.250	53.50	52.10	....	56.20
2.375	53.50	52.10	....	....
2.500	53.50	52.10	....	56.20
2.625	....	50.40	....	....
2.750	51.90	50.40	....	56.20
2.875	....	50.40	....	....
3.000	51.90	50.40	....	56.20
3.125	....	50.40	....	....
3.250	....	50.40	....	....
3.375	....	50.40	....	....

*Selected sizes.

Forging Stock: Round, Class 1, random lengths, diam. 0.375-8 in., "F" temper; 2014, 42.20-55.00; 6061, 41.60-55.00; 7075, 61.60-75.00; 7070, 66.60-80.00.

Pipe: ASA schedule 40, alloy 6063-T6 standard lengths, plain ends, 90,000 lb base, dollars per 100 ft. Nominal pipe sizes: ¾ in., 18.85; 1 in., 29.75; 1¼ in., 40.30; 1½ in., 48.15; 2 in., 58.30; 4 in., 160.20; 6 in., 287.55; 8 in., 432.70.

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	42.70-44.20	51.30-55.50
12-14	42.70-44.20	52.00-56.50
15-17	42.70-44.20	53.20-58.20
18-20	43.20-44.70	55.20-60.80

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grades, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24.72 in. widths; .125 in., 74.90; .188 in., 71.70-72.10; .25-.75 in., 70.60-71.60. Tooling plate, .25-.30 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots.)

Copper and Brass: No. 1 heavy copper and wire, 23.75-24.25; No. 2 heavy copper and wire, 21.75-22.25; light copper, 19.50-20.00; No. 1 composition red brass, 17.50-18.00; No. 1 composition, 17.00-17.50; No. 1 composition turnings, 17.00-17.50; No. 1 yellow brass rod turnings, 13.00-13.50; new brass clippings, 16.00-16.50; No. 1 brass rod ends, 16.00-16.50; No. 2 yellow brass turnings, 11.00-11.50; No. 1 red car boxes, 19.00-19.50; cocks and faucets, 17.00-17.50; mixed red and yellow brass, 14.00-14.50; unlined red car boxes, 17.00-17.50; auto radiators (unsweated), 14.00-14.50.

Lead: Heavy, 11.00-11.50; battery plates (dry), 5.00-5.50; battery plates (wet), 6.00-6.50; linotype and stereotype, 13.00-13.50; electrotype, 11.00-11.50; mixed babbitt, 13.00-13.50; solder joints, 12.00-12.50; tea lead, 8.00-8.50.

Zinc: New clippings, 10.00-10.50; old zinc, 7.00-7.50; new diecasting scrap, 9.00-9.50; old diecasting scrap, 6.00-6.50; zinc routings, 8.00-8.50.

Nickel and Monel: Pure nickel clippings, 60.00-65.00; nickel anode, 55.00-60.00; nickel turnings, 50.00-55.00; Monel clippings, 30.00-35.00; Monel turnings, 25.00-30.00; nickel silver clippings, 30.00-35.00; nickel silver turnings, 25.00-30.00.

Aluminum: Pistons, 13.00-13.50; crankcases, 13.00-13.50; new clippings, 20.00-20.50; old sheet, 13.00-13.50; old castings, 13.00-13.50; borings and turnings, 11.00-11.50; dural clippings, 17.00-17.50; 2S clippings, 19.00-19.50; 24S clippings, 17.00-17.50; 52S clippings, 19.00-19.50; 61S clippings, 19.00-19.50; 75S clippings, 17.00-17.50; 14S clippings, 17.00-17.50; 17S clippings, 17.00-17.50; 53S clippings, 19.00-19.50; 56S clippings, 19.00-19.50; 57S clippings, 19.00-19.50; 61S clippings, 19.00-19.50; 63S clippings, 19.00-19.50; 67S clippings, 19.00-19.50; 70S clippings, 19.00-19.50; 71S clippings, 19.00-19.50; 72S clippings, 19.00-19.50; 75S clippings, 19.00-19.50; 76S clippings, 19.00-19.50; 78S clippings, 19.00-19.50; 81S clippings, 19.00-19.50; 82S clippings, 19.00-19.50; 83S clippings, 19.00-19.50; 84S clippings, 19.00-19.50; 85S clippings, 19.00-19.50; 86S clippings, 19.00-19.50; 87S clippings, 19.00-19.50; 88S clippings, 19.00-19.50; 89S clippings, 19.00-19.50; 90S clippings, 19.00-19.50; 91S clippings, 19.00-19.50; 92S clippings, 19.00-19.50; 93S clippings, 19.00-19.50;

position turnings, 16.50-17.00, new brass clippings, 17.00-17.50; light brass, 12.00-12.50; heavy yellow brass, 13.00-13.50; new brass rod ends, 14.00-14.50; auto radiators, unsweated, 14.25-15.25; cocks and faucets, 14.00-14.50; brass pipe, 14.25-14.75.

Lead: Heavy, 8.50-9.00; battery plates, 4.75-5.25; linotype and stereotype, 10.50-11.00; electrotype, 9.00-9.50; mixed babbitt, 9.50-10.00.

Monel: Clippings, 32.00-34.00; old sheets, 28.00-30.00; turnings, 22.00-24.00; rods, 32.00-34.00.

Nickel: Sheets and clips, 52.00-55.00; rolled anodes, 52.00-55.00; turnings, 37.00-40.00; rod ends, 52.00-55.00.

Zinc: Old zinc, 4.00-4.25; new diecast scrap, 3.75-4.00; old diecast scrap, 2.50-2.75.

Aluminum: Old castings and sheets, 10.00-10.50; clean borings and turnings, 6.50-7.00; segregated low copper clips, 13.00-13.50; segregated high copper clips, 12.00-12.50; mixed low copper clips, 13.00-13.25; mixed high copper clips, 12.00-12.25.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 11.00-11.50; clean borings and turnings, 10.00-10.50; segregated low copper clips, 16.50-17.00; segregated high copper clips, 15.50-16.00; mixed low copper clips, 16.00-16.50; mixed high copper clips, 15.00-15.50.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 11.00-11.50; clean borings and turnings, 10.00-10.50; segregated low copper clips, 15.00-15.50; segregated high copper clips, 13.50-14.00; mixed low copper clips, 14.50-15.00; mixed high copper clips, 13.00-13.50.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 55.00; light scrap, 50.00; turnings and borings, 35.00.

Copper and Brass: No. 1 heavy copper and wire, 25.50; No. 2 heavy copper and wire, 24.50; light copper, 22.25; refinery brass (60% copper) per dry copper content, 23.25.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 25.50; No. 2 heavy copper and wire, 24.50; light copper, 22.25; No. 1 composition borings, 20.00; No. 1 composition solids, 20.50; heavy yellow brass solids, 14.50; yellow brass turnings, 13.50; radiators, 16.75.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.45.

Copper: Flat-rolled, 45.79; oval, 44.00; 5000-10,000 lb; electrodeposited, 38.50, 2000-5000 lb lots; cast, 41.00, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 100-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25, 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 118.50; 200-499 lb, 117.00; 500-999 lb, 116.50; 1000 lb or more, 116.00.

Zinc: Balls, 18.00; flat tops, 18.00; flats, 20.75; ovals, 20.00, ton lots.

CHEMICALS

Cadmium Oxide: $1.45 per lb in 100-lb drums.

Chromic Acid (flake): 100-2000 lb, 31.00; 2000-10,000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,000 lb or more, 29.50.

Copper Cyanide: 100-200 lb, 65.90; 300-900 lb, 63.90; 1000-19,900 lb, 61.90.

Copper Sulphate: 100-1900 lb, 14.65; 2000-5900 lb, 12.65; 6000-11,900 lb, 12.40; 12,000-22,900 lb, 12.15; 23,000 lb or more, 11.65.

Nickel Chloride: 100 lb, 45.00; 200 lb, 43.00; 300 lb, 42.00; 400-4900 lb, 40.00; 5000-9900 lb, 38.00; 10,000 lb or more, 37.00.

Nickel Sulphate: 5000-22,999 lb, 29.00; 23,000-39,990 lb, 28.50; 40,000 lb or more, 28.00.

Sodium Cyanide (Cyanobrik): 200 lb, 20.80; 400-800 lb, 19.80; 1000-19,800 lb, 18.80; 20,000 lb or more, 17.80.

Sodium Stannate: Less than 100 lb, 78.50; 100-600 lb, 69.20; 700-1900 lb, 66.40; 2000-9900 lb, 64.60; 10,000 lb or more, 63.30.

Stannous Chloride (anhydrous): 25 lb, 153.80; 100 lb, 148.90; 400 lb, 146.50; 800-19,900 lb, 105.60; 20,000 lb or more, 99.50.

Stannous Sulphate: Less than 50 lb, 139.00; 50 lb, 109.00; 100-1900 lb, 107.00; 2000 lb or more, 105.00.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

(*Concluded from Page 175*)

The Dutch iron has been sold at around $64 on cars, Philadelphia. The German iron, brought in by two importers, has been offered at $57 to $60 on cars, Philadelphia.

Pacific Car & Foundry Co., Renton, Wash., has purchased a government-owned foundry building (140,000 sq ft) in that city. Built in 1943, it will be remodeled for the production of small castings.

A. O. Smith Recalls 450

A. O. Smith Corp. called back 450 workmen at its Milwaukee automobile frame division on Nov. 10. They had been laid off in October because of work stoppages at auto manufacturing plants.

About 250 are still laid off, and it's hoped they can be recalled by the end of November. There's a possibility an additional 200 may be needed.

Prices of Imported Steel Likely To Be Increased

Market observers in the Southwest say foreign mills have failed to deliver after announcing price reductions recently. Indications are that imported steel prices will climb above those in effect before reductions ($2 to $3) were announced.

CLASSIFIED ADVERTISING

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Graduate Metallurgist, not over 35, with degree in Metallurgy or Metallurgical Eng. Must have Ferrous background and several years experience, preferably in electric furnace shop producing rolled product. Duties primarily in production and development and will include test evaluation.

Reply Box 701, STEEL
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Mill now being built in Fairbanks, Alaska, and will be in operation in April, 1959. Mill will roll mainly reinforcing bars and will produce during the months of April through October, but key personnel will be compensated on an annual basis.

Personnel inquiries requested for melters, chemists, rollers, superintendents, managers and lesser related positions. Please enclose full particulars, including picture and reference, in first letter to

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BLAST FURNACE SUPERVISOR—Experienced blast furnace operator to assist in start-up and initial operation of new furnace located in Spain. Duration of job is one year; however, applications for permanent position will be considered. Call or write KOPPERS COMPANY, INC., Freyn Department, Pittsburgh 19, Pennsylvania.

ASSISTANT TO CHIEF ENGINEER. Excellent opportunity for man with experience in fabrication of equipment for the chemical process industry. Must be able to estimate labor and material with some sales engineering related to stainless steel and alloy pressure vessels. Send resume and salary requirements to Stainless Products, Inc., Box 328, Clifton, N. J.

Positions Wanted

MANUFACTURING MANAGER: Administrator and organizer. Directed all areas of operation in jobbing and mass producing sheet metal items, stampings, structures, weldments, pressure vessels, machinery, and tools. Successful in technological advancement, costing, material and production controls, all elements Plant and Industrial Engineering, manufacture, etc. College educated. Qualified by experience Works Manager to V. P. Operations any size company. Please specify interest. Reply Box 703, STEEL, Penton Bldg., Cleveland 13, Ohio.

PURCHASING EXECUTIVE: 14 years experience. Heavy in raw materials and purchase parts. Ability to head up large or small department. Experienced in purchasing procedures, systems and value analysis. Thorough knowledge of materials control, scheduling and expediting. Plant phase out requires relocation. Write Box 705, STEEL, Penton Bldg., Cleveland 13, Ohio.

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Horsburgh & Scott is proud to have supplied the spur gears that drive this machine—designed and built by Bertsch & Co., Cambridge City, Indiana. Largest of its kind, it bends cold steel plates up to 4¼ inches thick, 16 feet long; weighs over ¾ of a million pounds.

Horsburgh & Scott has facilities to generate gears up to 125″ diameter and to form-mill spur gears up to 160″. We have a complete industrial gear line including worm, helical and herringbone speed reducers.

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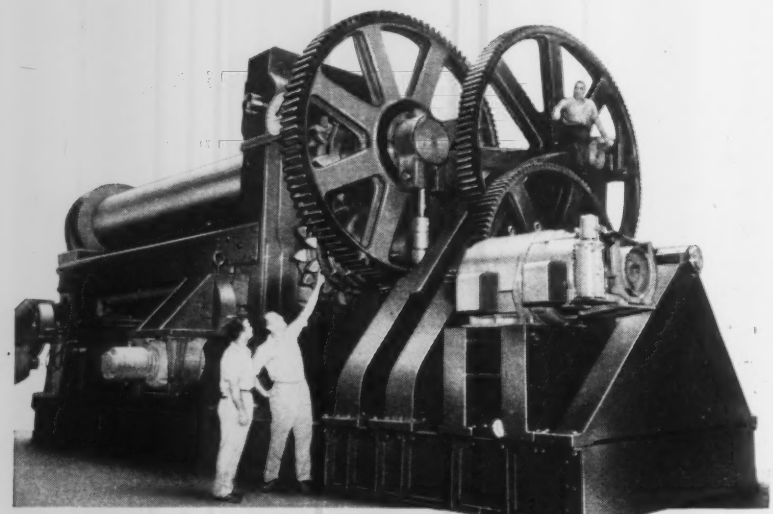

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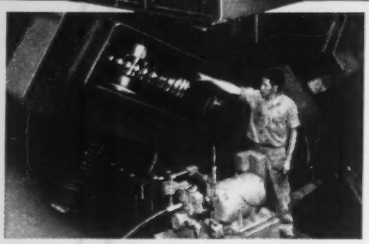

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Foreign mills probably left the market during the first week of November while working on a new pricing formula.

Service Center Orders up

For the first time this year steel service center shipments have reached last fall's pace, reports Robert G. Welch, executive vice president, American Steel Warehouse Association, Cleveland.

He told a directors' meeting of the association at Boca Raton, Fla., that the industry's shipments have been rising slowly, but steadily, in recent weeks. Indications are the last quarter will show improvement over the same period in 1957.

Reports from the chapter directors confirmed Mr. Welch's views. But preliminary estimates for 1958 show service center tonnage will run 25 to 30 per cent under the 1957 total. Outlook for 1959: Substantial improvement.

Service center inventories are in good shape (about 3.3 million tons). Stocks were reduced about 10 per cent during the first three quarters of this year. Mr. Welch thinks steel purchases will be up moderately this quarter.

Distributors . . .

Prices, Page 170

Business is a bit livelier for most steel service centers. Many industries are replenishing stocks as consumption gains on a broad front. Distributors, in turn, are buying more freely from the mills, fortifying their position to meet the increased demand. Some market interests believe galvanized products could be in tight supply by spring.

Tubular Goods . . .

Tubular Goods Prices, Page 169

Production of buttweld pipe is being pushed at a faster pace than it was in October. Customers are replenishing their inventories, largely because contracting and maintenance work in factories and buildings is moving at a better rate. Heating system installations are giving the market a much needed spur.

The Mississippi River Fuel Corp. plans an $8 million natural gas pipeline from Oran, Mo., to St. Louis (115 miles).

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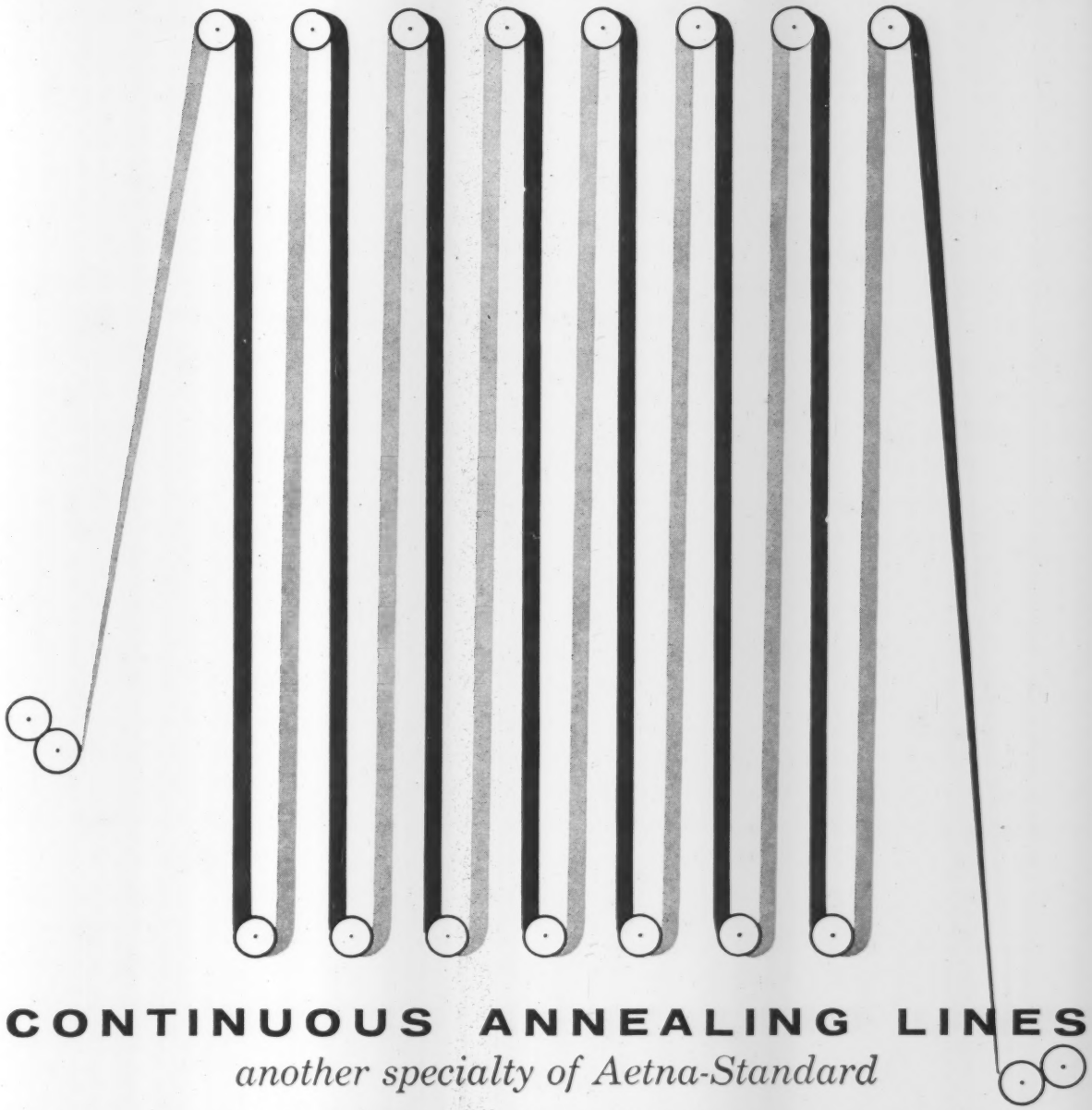

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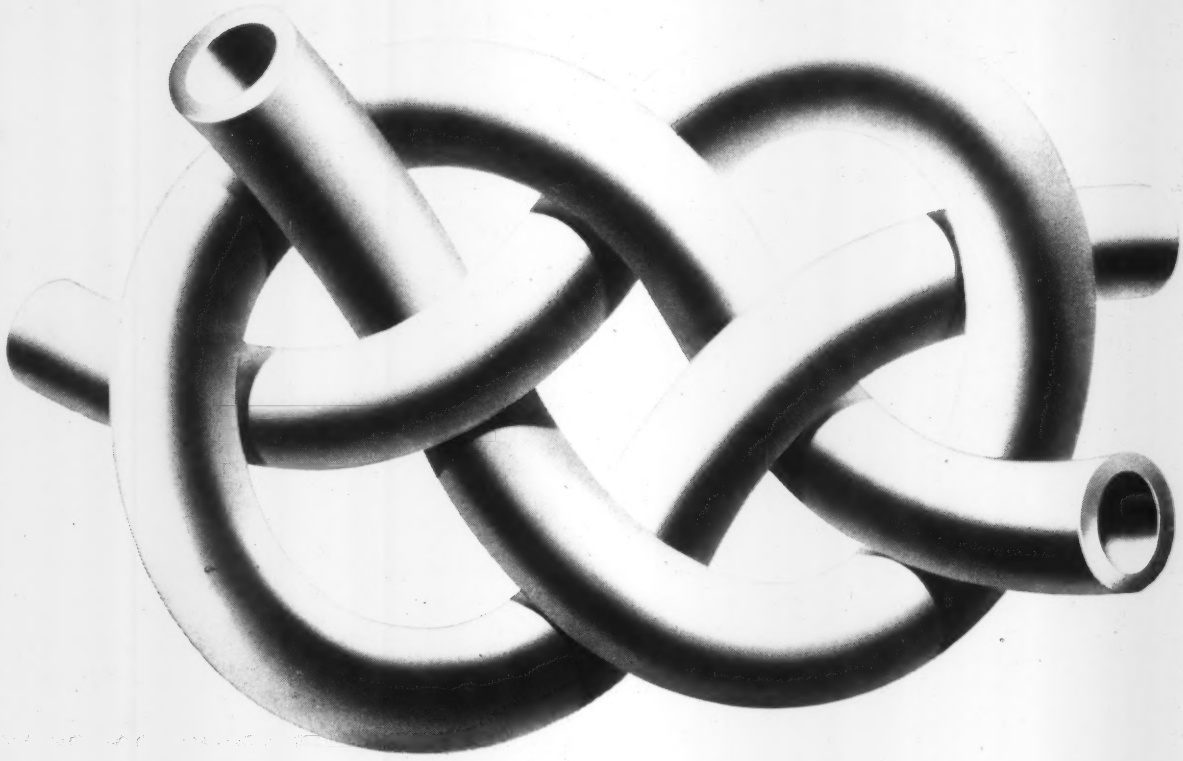

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